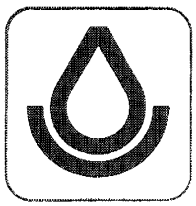
SOIL SURVEY

Wake County North Carolina



Issued November 1970

UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service
In cooperation with
NORTH CAROLINA AGRICULTURAL EXPERIMENT STATION

Major fieldwork for this soil survey was done in the period 1957–65. Soil names and descriptions were approved in 1966. Unless otherwise indicated, statements in the publication refer to conditions in the county at the time the survey was in progress. This survey of Wake County was made cooperatively by the Soil Conservation Service and the North Carolina Agricultural Experiment Station. It is a part of the technical assistance furnished to the Wake Soil and Water Conservation District by the Soil Conservation Service.

Either enlarged or reduced copies of the printed soil map in this publication can be made by commercial photographers, or can be purchased, on individual order, from the Cartographic Division, Soil Conservation Service, USDA, Washington, D.C. 20250.

HOW TO USE THIS SOIL SURVEY

THIS SOIL SURVEY of Wake County, N.C., contains information that can be applied in managing farms and woodlands; in selecting sites for roads, ponds, and buildings or other structures; and in estimating suitability of tracts of land for agriculture, industry, recreation, and other uses.

Locating Soils

All the soils of Wake County are shown on the detailed map at the back of this survey. This map consists of many sheets made from aerial photographs. Each sheet is numbered to correspond with numbers shown on the Index to Map Sheets.

On each sheet of the detailed map, soil areas are outlined and are identified by symbol. All areas marked with the same symbol are the same kind of soil. The soil symbol is inside the area if there is enough room; otherwise, it is outside and a pointer shows where the symbol belongs.

Finding and Using Information

The "Guide to Mapping Units" can be used to find information in this survey. This guide lists all of the soils of the county in alphabetical order by map symbol. It shows the page where each kind of soil is described and also the page for the capability unit, woodland group, and wildlife group in which the soil has been placed.

Individual colored maps showing the relative suitability or degree of limitation of soils for many specific purposes can be developed by using the soil map and the information in the text. Translucent material can be used as an overlay over the soil map and colored to show soils that have the same limitations or suitability. For example, soils that have a slight limitation for a given use can be colored green, those with a moderate limitation can be colored yellow, and those with a severe limitation can be colored red.

Farmers and those who work with farmers can learn about use and management of the soils from the soil descriptions and from the discussion of the capability units.

Foresters and others can refer to the section "Use of the Soils as Woodland," where the soils of the county are grouped according to their suitability for trees.

Game managers, sportsmen, and others concerned with wildlife will find information about soils and wildlife in the section "Use of the Soils for Wildlife."

Engineers and builders will find, under "Engineering Uses of the Soils," tables that give descriptions of the engineering properties of the soils in the county and that name soil features that affect engineering practices and structures.

Scientists and others can read about how the soils formed and how they are classified in the section "Formation and Classification of Soils."

Newcomers to Wake County may be especially interested in the section "General Soil Map," where broad patterns of soils are described. They may also be interested in the section "Additional Facts About the County."

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SOIL SURVEY OF WAKE COUNTY, NORTH CAROLINA

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SOILS SURVEYED BY JOEL W. CAWTHORN, VAN S. JENKINS, RONALD B. STEPHENS, WILLIAM I. SHOPE, R. CLYDE PLEASANTS, DANIEL G. SPANGLER, GORDON H. ROBERSON, CARL F. EBY, OWEN R. DEMO, JAMES R. WOODRUFF, AND JOHN H. LANE, SOIL CONSERVATION SERVICE, AND BY JOHN P. BRYANT, ROBERT M. CRAIG, CHARLES D. SOPHER, AND DON W. GOSS, NORTH CAROLINA AGRICULTURAL EXPERIMENT STATION

UNITED STATES DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE, IN COOPERATION WITH THE NORTH CAROLINA AGRICULTURAL EXPERIMENT STATION

WAKE COUNTY, in the east-central part of North Carolina (fig. 1), has a land area of 864 square miles. Raleigh is the county seat and is the capital of the State. The county had a population of 169,082 in 1965. The population of Raleigh was 93,931 in that year.

The county is mostly in the Piedmont physiographic province, but a small area in the southern part is in the Coastal Plain province. The parts of the county that lie north and west of Raleigh are rolling to hilly and contain major drainageways that are bordered by steep slopes. The areas east and south of Raleigh are gently sloping to rolling and contain drainageways that are bordered by moderately steep slopes.

Farming is a leading enterprise in the county. The comparatively short, mild winters and the long, hot summers permit a wide range in types of farming and in choice of crops. Tobacco is the chief cash crop, and contributes a major part of the farm income. The rest of the farm income is derived mostly from sales of cotton, soybeans, corn, small grains, and vegetables, and from poultry and eggs, dairy products, hogs, and beef cattle. Well-diversified industries, government, educational institutions, and wholesale and retail outlets also contribute substantially to the economy of the county.

In 1964 approximately 100,478 acres was in field crops and 31,162 acres was in pasture.[1] The rest of the acreage was largely in trees, though some areas were in cities or community developments and about 5,100 acres was in State parks. The parks are used for camping, picnicking, boating, swimming, hiking, fishing, and nature study.

The soils of Wake county are mostly strongly acid and strongly leached; only the Enon soils have a base saturation of more than 35 percent. The soils are generally low in natural fertility and in content of organic matter. Except in areas where suitable applications of lime and fertilizer have been made, the content of calcium, phosphorus, and potassium is low. About 63 percent of the acreage consists of well drained soils; about 13 percent, of moderately well drained soils; about 6 percent, of somewhat poorly drained soils; 8 percent, of poorly drained or very poorly drained soils; and 10 percent, of somewhat excessively drained, droughty soils.

[1] Statistics from records of the U.S. Bureau of the Census.

How This Survey Was Made

Soil scientists made this survey to learn what kinds of soils are in Wake County, where they are located, and how they can be used. They went into the county knowing they likely would find many soils they had already seen, and perhaps some they had not. As they traveled over the county, they observed steepness, length, and shape of slopes; size of streams; kinds of native plants or crops; kinds of rock; and many facts about the soils. They dug or bored many holes to expose soil profiles. A profile is the sequence of natural layers, or horizons, in a soil; it extends from the surface down into the parent material that has not been changed much by leaching or by roots of plants.

The soil scientists made comparisons among the profiles they studied, and they compared these profiles with those in counties nearby and in places more distant. They classified and named the soils according to nationwide, uniform procedures. To use this survey efficiently, it is necessary to know the kinds of groupings most used in a local soil classification.

Soils that have profiles almost alike make up a soil series. Except for different texture in the surface layer, all the soils in one series have major horizons that are similar in thickness, arrangement, and other important characteristics. Each soil series is named for a town or other geographic feature near the place where a soil of that series was first observed and mapped. Appling and Norfolk, for example, are the names of two soil series.

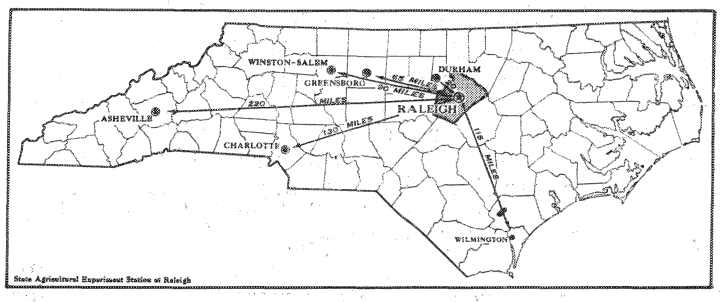

Figure 1.—Location of Wake County in North Carolina.

All the soils in the United States having the same series name are essentially alike in those characteristics that affect their behavior in the natural landscape. Soils of one series can differ somewhat in texture of the surface soil and in slope or some other characteristic that affects use of the soils by man.

Many soil series contain soils that differ in texture of their surface layer. According to such differences in texture, separations called soil types are made. Within a series, all the soils having a surface layer of the same texture belong to one soil type. Cecil sandy loam and Cecil clay loam are two soil types in the Cecil series. The difference in texture of their surface layers is apparent from their names.

Some soil types vary so much in slope, degree of erosion, or some other feature affecting their use, that practical suggestions about their management could not be made if they were shown on the soil map as one unit. Such soil types are divided into phases. The name of a soil phase indicates a feature that affects management. For example, Cecil sandy loam, 2 to 6 percent slopes, is one of several phases of Cecil sandy loam, a soil type that ranges from gently sloping to steep.

After a guide for classifying and naming the soils had been worked out, the soil scientists drew the boundaries of the individual soils on aerial photographs. These photographs show woodlands, buildings, field borders, trees, and other details that greatly help in drawing boundaries accurately. The soil map in the back of this survey was prepared from aerial photographs.

The areas shown on a soil map are called mapping units. On most maps detailed enough to be useful in planning management of farms and fields, a mapping unit is nearly equivalent to a soil type or a phase of a soil type. It is not exactly equivalent, because it is not practical to show on such a map all the small, scattered bits of soil of some other kind that have been seen within an area that is dominantly of a recognized soil type or soil phase.

In preparing some detailed maps, the soil scientists have a problem of delineating areas where different kinds of soils are so intricately mixed, and so small in size that it is not practical to show them separately on the map. Therefore, they show this mixture of soils as one mapping unit and call it a soil complex. Ordinarily, a soil complex is named for the major kinds of soil in it, for example, Louisburg-Wedowee complex, 6 to 10 percent slopes. Also, in some places two or more soils are mapped in a single unit, called an undifferentiated soil group or undifferentiated unit, if the differences between the soils are too small to justify separation, though these soils occur separately. An example of such a unit is Wehadkee and Bibb soils. Furthermore, on most soil maps areas are shown where the soil material is so wet, rocky, shallow, frequently worked by wind and water, or altered by man that it cannot be classified by soil series. These areas are shown on the map like other mapping units but are given descriptive names, such as Gullied land, Made land, or Swamp, and are called land types.

While a soil survey is in progress, samples of soils are taken, as needed, for laboratory measurements and for engineering tests. Laboratory data from the same kinds of soils in other places are assembled. Data on yields of crops under defined practices are assembled from farm records and from field or plot experiments on the same kinds of soils. Yields under defined management are estimated for all the soils.

But only part of a soil survey is done when the soils have been named, described, and delineated on the map, the laboratory data assembled, and yield estimates made. The mass of detailed information then needs to be organized in such a way that it is readily useful to different groups of readers, among them farmers, managers of woodland, engineers, and homeowners. Grouping soils that are similar in suitability for each specified use is the method of organization commonly used in the soil surveys. On the basis of yield and practice tables and other data, the soil scientists set up trial groups. They test these groups by further study and by consultation with farmers, agronomists, engineers, and others, and then adjust them according to the results of their studies and consultations. Thus, the groups that are finally evolved reflect up-to-date knowledge of the soils and their behavior under present methods of use and management.

General Soil Map

The general soil map at the back of this soil survey shows, in color, the soil associations in Wake County. A soil association is a landscape that has a distinctive proportional pattern of soils. It normally consists of one or more major soils and at least one minor soil, and it is named for the major soils. The soils in one association may occur in another, but in a different pattern.

A map showing soil associations is useful to people who want a general idea of the soils in a county, who want to compare different parts of a county, or who want to know the location of large tracts that are suitable for a certain kind of farming or other land use. Such a map is not suitable for planning the management of a farm or field, because the soils in any one association ordinarily differ in slope, depth, stoniness, drainage, and other characteristics that affect management.

Ten associations are in Wake County. These are discussed in the following pages.

1. Creedmoor-White Store Association

Gently sloping to hilly, deep and moderately deep, moderately well drained soils that have a very firm clayey subsoil; derived from sandstone, shale, and mudstone

This association consists of gently sloping soils on broad ridges and of hilly soils near drainageways in the uplands. The areas are dissected by many streams that form a dendritic drainage pattern. The association occupies about 15 percent of the county and is in the western part.

The major soils in the association are the Creedmoor and White Store, which formed in material that weathered from sandstone, shale, and mudstone of Triassic age. The Creedmoor soils, which are moderately well drained and deep, make up about 50 percent of the association. They have a sandy loam or silt loam surface

layer, a friable silty clay loam to sandy clay loam upper subsoil, and a very firm, very plastic clay lower subsoil.

Moderately well drained, moderately deep White Store soils make up about 30 percent of the association. They have a sandy loam, silt loam, or clay loam surface layer over a subsoil of very firm and very plastic clay.

Minor soils are the Mayodan, Granville, Pinkston, Chewacla, Wehadkee, Altavista, Wahee, and Augusta.

Except in the steep areas, most of the soils have been cultivated. Now, about 70 percent of the association is in forest and the rest is still cultivated or in pasture. The farms are generally less than 100 acres in size, and most are operated by the owner on a full-time basis. The growing of tobacco and, to a lesser extent, the raising of livestock are the main farm enterprises. Some commercial companies own woodlots within the association, and these forestry farms are much larger than the farms where field crops are grown.

The soils of this association are suited to tobacco, corn, cotton, and small grains. In many places they have a high content of exchangeable aluminum, however, and if they are not properly limed, some crops grown on them show signs of aluminum toxicity. In areas that are not severely eroded, the soils are fairly easily tilled and crops grown on them respond favorably to good management. The soils are subject to erosion. The Creedmoor, Mayodan, and Granville soils are the ones most used for tobacco.

The major soils of this association have severe limitations if used as absorption fields for septic tanks. Also, their very firm or very plastic subsoil makes them poorly suited to road construction or as support for foundation footings of large buildings.

Wells in this association generally yield about 3 to 5 gallons of water per minute, which is not enough for industrial use. The amount of surface water available varies considerably, according to the season.

2. Mayodan-Granville-Creedmoor Association

Gently sloping to moderately steep, deep or moderately deep, well drained and moderately well drained soils that have a subsoil of friable sandy clay loam to very firm clay; derived from sandstone, shale, and mudstone

This association is dissected by many streams that form a dendritic drainage pattern. It is on uplands and consists of gently sloping soils on broad ridges, and of moderately steep soils near the major drainageways. The association is in the western part of the county, near the towns of Apex and Friendship and west of Holly Springs. It occupies about 4 percent of the county.

The major soils are the Mayodan, Granville, and Creedmoor. These soils have formed in material that weathered from sandstone, shale, and mudstone of Triassic age.

Well-drained, moderately deep or deep Mayodan soils make up about 55 percent of the association. They have a surface layer of sandy loam or gravelly sandy loam to silt loam over a subsoil of firm silty clay loam to clay.

Well-drained, deep Granville soils make up about 15 percent of the association. They have a surface layer of sandy loam and a subsoil of friable sandy clay loam to clay loam.

Moderately well drained, deep Creedmoor soils make up another 15 percent. They have a surface layer of sandy loam to silt loam, an upper subsoil of friable silty clay loam to sandy clay loam, and a lower subsoil of clay that is very firm when moist and very plastic when wet.

The rest of the association consists mainly of minor areas of White Store, Altavista, Augusta, Wahee, Chewacla, and Wehadkee soils.

Most of the soils that are less than moderately steep have been cultivated. Now, about half of this association is in cultivated crops or pasture and the rest is in forest. The farms are generally less than 100 acres in size, and most are operated by the owner on a full-time basis. Growing tobacco, raising cattle, and growing trees are the chief farming enterprises.

The soils are suited to tobacco, corn, cotton, alfalfa, lespedeza, and small grains. They contain a large amount of exchangeable aluminum, however, and some crops grown on them show signs of aluminum toxicity, unless the soils have been properly limed. The soils are easily tilled, and the crops respond well to good management. Erosion is a hazard.

In some places in this association, the soils have severe limitations if used as absorption fields for septic tanks. Also, the soils that have a very firm or very plastic subsoil are of limited use for road construction or as support for foundation footings of large buildings.

Wells in this association generally yield about 3 to 5 gallons of water per minute, which is not enough for industrial use. The amount of surface water varies a great deal, according to the season.

3. Herndon-Georgeville Association

Gently sloping to moderately steep, deep, well-drained soils that have a subsoil of friable silty clay loam to clay; derived from phyllite (Carolina slates)

This association is in the uplands. It is made up of gently sloping soils on ridges, of gently sloping to strongly sloping soils on side slopes near small drainageways, and of moderately steep soils on side slopes near large drainageways and streams. The association is dissected by many streams that form a dendritic pattern. In the western part of the county, it consists of a long, narrow area, extending from the town of Holly Springs to Cary. In the eastern part, it occupies a small area east of the town of Zebulon and extends to the Johnston and Nash County lines. This association occupies about 2 percent of the county.

Well-drained, deep Herndon soils occupy about 45 percent of the association. They have a surface layer of silt loam and a subsoil of friable silty clay loam to silty clay.

Well-drained, deep Georgeville soils make up about 40 percent of the association. They also have a surface layer of silt loam, but their subsoil is firm silty clay loam to clay.

The rest of the association consists mainly of minor areas of Appling, Cecil, Wilkes, Enon, Chewacla, Wehadkee, and Bibb soils.

Except for the moderately steep areas, all of the soils of this association have been cultivated within the past 100 years. Now, about 80 percent of the association is in forest, and the rest is used for cultivated crops or pasture.

The farms are generally about 200 acres in size and are operated by the owner. Growing tobacco and raising cattle are the chief farming enterprises.

The soils of this association are suited to tobacco, corn, cotton, alfalfa, lespedeza, and small grains. They are fairly easy to till, and crops grown on them respond well to applications of lime and fertilizer. Erosion is a hazard.

The Herndon and Georgeville soils have moderate limitations if used for absorption fields for septic tanks. They have no special limitations if used for road construction or as support for foundation footings of large buildings.

Wells adequate for industrial use can be located within this association. Yields of 10 to 15 gallons of water per minute are common from private wells. The quantity of surface water is good, and the supply is generally constant, except during periods of extreme drought.

4. Appling-Durham Association

Gently sloping to sloping, deep, well-drained soils that have a subsoil of friable sandy clay loam to firm clay; derived mostly from granite, gneiss, and schist

This association consists of gently sloping and sloping soils on ridges and side slopes in the uplands. It occupies two long, narrow areas in the eastern part of the county. The areas are dissected by many small streams that form a dendritic drainage pattern. The association occupies about 2 percent of the county.

A major part of the association consists of Appling and Durham soils, which formed in material that weathered from granite and gneiss. Appling soils make up about 50 percent of the association. They are deep and well drained and have a surface layer of sandy loam, gravelly sandy loam, or fine sandy loam. Their subsoil is firm clay loam to clay.

Deep, well-drained Durham soils make up about 40 percent. They have a surface layer of loamy sand and a subsoil of friable sandy clay loam to clay.

The rest of the association consists mainly of minor areas of Vance, Colfax, Worsham, Mantachie, Congaree, Chewacla, Wehadkee, and Bibb soils.

Most of the areas, except those that are wet, have been cultivated within the past 100 years. Now, about 85 percent of this association is cultivated and the rest is in forest. The farms are generally more than 100 acres in size and are operated by the owner. Tobacco, cotton, corn, soybeans, and small grains are the chief sources of farm income.

The soils are suited to corn, cotton, soybeans, lespedeza, small grains, and pasture, and they are especially well suited to tobacco. They are easily tilled, and crops grown on them respond well if suitable applications of lime and fertilizer are made.

The Appling and Durham soils have moderate limitations if used as absorption fields for septic tanks. They have no special limitations if used for road construction or as the support of foundation footings for large buildings.

Wells adequate for industrial use can be located within this association. Yields of 10 to 15 gallons of water per minute are common from private wells. The quantity of surface water is good, and the supply is fairly constant, except during periods of extreme drought.

5. Cecil-Appling Association

Gently sloping to steep, deep, well-drained soils that have a subsoil of firm clay loam to clay; derived mostly from granite, gneiss, and schist

This association occupies several large areas on the uplands of the county. It consists of gently sloping soils on ridges and of sloping to steep soils near drainageways and streams. The areas are dissected by many streams that form a dendritic drainage pattern. The association occupies about 16 percent of the county.

Deep, well-drained Cecil and Appling soils make up a major part of the association. They have formed in material that weathered from gneiss and schist. Some areas of Cecil soils are moderately steep or steep, but the Appling soils are less sloping.

The Cecil soils make up about 35 percent of the association. They have a surface layer of sandy loam, gravelly sandy loam, or clay loam and a subsoil of red, firm clay.

Appling soils make up about 30 percent of the association. They have a surface layer of sandy loam, gravelly sandy loam, or fine sandy loam and a subsoil of firm clay loam to clay.

Minor soils make up the rest of the association. They are the Wedowee, Louisburg, Colfax, Worsham, Chewacla, Congaree, Wehadkee, Bibb, and Altavista.

Most of the farms in this association are at least 200 acres in size. The soils in the northern part of the association are mainly idle or in forest. In those areas the chief farming enterprises are the raising of beef cattle and providing pasture for the cattle. Most of the acreage in the southern part is in pasture or in cultivated crops, mainly tobacco, corn, and soybeans.

The soils of this association are well suited to tobacco, corn, cotton, soybeans, lespedeza, small grains, and pasture. They are easily tilled, and crops grown on them respond well if suitable applications of lime and fertilizer are made. Erosion is a hazard.

The Cecil and Appling soils have moderate limitations if used as absorption fields for septic tanks. They have no special limitations if used for road construction or as support for foundation footings of large buildings.

Wells adequate for industrial use can be located within this association. Yields of 10 to 15 gallons of water per minute are common from private wells. The quantity of surface water is good, and the supply is fairly constant, except during periods of extreme drought.

6. Cecil Association

Gently sloping to steep, deep, well-drained soils that have a subsoil of firm red clay; derived mostly from gneiss and schist

This association consists of gently sloping soils on ridges and of sloping to steep soils on the sides of ridges. It is in the uplands, mainly in the central and north-central parts of the county. The areas are dissected by

many streams that form a dendritic drainage pattern. This association occupies about 18 percent of the county.

Deep, well-drained Cecil soils, which formed in material that weathered from gneiss and schist, occupy about 65 percent of the association. They have a surface layer of sandy loam or gravelly sandy loam to clay loam and a subsoil of firm, red clay.

Soils that make up the rest of the association are mainly the Appling, Madison, Wedowee, Enon, Wilkes, Chewacla, Congaree, Wehadkee, and Bibb.

Except for the steep areas, the soils in most of this association have been cultivated within the past 100 years. Now, about 80 percent of the association is in forest and the rest is cultivated or in pasture. The farms are generally about 150 acres in size, and most of them are operated by the owner. Growing tobacco and raising cattle are the chief farming enterprises.

The soils are suited to tobacco, corn, cotton, soybeans, lespedeza, small grains, and pasture. They are easily tilled but are susceptible to erosion. Crops grown on them respond well if suitable applications of lime and fertilizer are made.

The Cecil soils of this association have moderate limitations if used as absorption fields for septic tanks. They have no special limitations if used for road construction or as support for foundation footings of large buildings.

Wells adequate for industrial use can be located within the association. Yields of 10 to 15 gallons of water per minute are common from private wells. The quantity of surface water is good, and the supply is fairly constant, except during periods of extreme drought.

7. Cecil-Madison Association

Gently sloping to steep, deep, well-drained soils that have a subsoil of red, friable to firm clay loam to clay; derived mostly from gneiss and schist

This association occupies an area about 2 miles wide on uplands in the northern part of the county. It consists of gently sloping soils on narrow ridges and of sloping to steep soils on the sides of ridges near drainageways and streams. The area is dissected by many streams that form a dendritic drainage pattern. The association occupies about 1 percent of the county.

Well-drained Cecil and Madison soils make up a major part of the association. They have formed in material that weathered from gneiss and schist.

Cecil soils occupy about 40 percent of the association. They are deep soils that have a surface layer of sandy loam, gravelly sandy loam, or clay loam and a subsoil of red, firm clay.

Madison soils occupy about 37 percent of the association. They are deep and have a surface layer of sandy loam and a subsoil of red to dark-red, friable clay loam to clay.

Soils that occupy the rest of the association are mainly those of the Appling, Wilkes, Chewacla, and Congaree series. Herndon, Enon, and Lloyd soils, however, occur in the southeastern part of the association, where a large area contains many outcroppings of soapstone high in content of talc. Many veins of highly basic minerals are mixed within the soapstone.

About 75 percent of this association is in forest, and the rest is cultivated or in pasture. The farms are generally less than 150 acres in size. The chief farming operation is the raising of beef cattle.

The soils are suited to tobacco, corn, cotton, soybeans, lespedeza, small grains, and pasture. They are susceptible to erosion but are easily tilled. Crops grown on them respond well to applications of lime and fertilizer.

The Cecil and Madison soils of this association have moderate limitations if used as absorption fields for septic tanks. They have no special limitations if used for road construction or as support for foundation footings of large buildings.

Wells adequate for industrial use can be located within the association. Yields of 10 to 15 gallons of water per minute are common from private wells. The quantity of surface water is good, and the supply is fairly constant, except during periods of extreme drought.

8. Appling Association

Gently sloping to moderately steep, deep, well-drained soils that have a subsoil of firm clay loam to clay; derived mostly from granite, gneiss, and schist

This association occupies three large areas of irregular shape in the eastern, central, and western parts of the county. It consists of gently sloping soils on ridges and of sloping to steep soils on the sides of ridges. The areas are in the uplands and are dissected by many streams that form a dendritic drainage pattern. This association occupies about 23 percent of the county.

Well-drained, deep Appling soils make up about 70 percent of the association. They have formed mainly in material that weathered from granite and gneiss but partly in material derived from schist. These soils have a surface layer of sandy loam, gravelly sandy loam, or fine sandy loam and a subsoil of firm clay loam to clay.

Soils that occupy the rest of the association are mainly those of the Durham, Wedowee, Vance, Louisburg, Colfax, Worsham, Mantachie, Congaree, Chewacla, Wehadkee, and Bibb series.

Except for wet areas, the soils in nearly all of this association have been cultivated in the past 100 years. Now, about 85 percent of the association is cultivated or in pasture and the rest is in forest. The farms are generally 100 to 200 acres in size and are mostly operated by the owner. The growing of tobacco, cotton, corn, and soybeans is the chief farming enterprise.

The soils of this association are suited to corn, cotton, soybeans, lespedeza, small grains, and pasture, and they are especially well suited to tobacco. They are easily tilled, but they are susceptible to erosion. Crops grown on them respond well if suitable applications of lime and fertilizer are made.

The Appling soils of this association have moderate limitations to use as absorption fields for septic tanks. They have no special limitations if used for road construction or as support for foundation footings of large buildings.

Wells adequate for industrial use can be located within the association. Yields of 10 to 15 gallons of water per minute are common from private wells. The quantity of

surface water is good, and the supply is fairly constant, except during periods of extreme drought.

9. Wagram-Norfolk Association

Nearly level to sloping, very deep, somewhat excessively drained and well drained soils that have a subsoil of friable sandy loam to sandy clay loam; formed in Coastal Plain sediments

This association is on uplands in the southern part of the county. It consists of nearly level or gently sloping soils on ridges, and of sloping soils on the sides of ridges. The area is dissected by many streams that form a dendritic drainage pattern. This association occupies about 9 percent of the county.

Wagram and Norfolk soils, which make up a major part of the association, have formed in Coastal Plain sediments. These soils are very deep.

Wagram soils, which are somewhat excessively drained, make up about 30 percent of the association. They have a surface layer of loamy sand about 20 to 40 inches thick. Their subsoil is friable sandy loam to sandy clay loam.

Well-drained Norfolk soils make up about 25 percent of the association. They have a surface layer of loamy sand and a subsoil of friable sandy loam to sandy clay loam.

The rest of the association consists mainly of soils of the Faceville, Orangeburg, Troup, Goldsboro, Lynchburg, Rains, Plummer, Appling, and Herndon series.

About 85 percent of this association is cultivated, and the rest is in forest. The farms are generally more than 200 acres in size and are operated by the owner. The growing of tobacco, cotton, corn, and soybeans is the chief farming enterprise.

The soils of this association are suited to tobacco, corn, cotton, soybeans, small grains, and pasture. They are easily tilled but are susceptible to erosion. Crops grown on them respond well if suitable applications of lime and fertilizer are made.

The Wagram and Norfolk soils of this association have only slight limitations to use as absorption fields for septic tanks. They have no special limitations if used for road construction or as support for foundation footings of large buildings.

Wells adequate for industrial use can be located within the association. Yields of 10 to 15 gallons of water per minute are common from private wells. The quantity of surface water is good, and the supply is fairly constant, except during periods of extreme drought.

10. Appling-Louisburg-Wedowee Association

Gently sloping to steep, deep and moderately deep, well drained and somewhat excessively drained soils that have a subsoil of very friable coarse sandy loam to firm clay; derived mostly from granite, gneiss, and schist

This association consists of gently sloping soils on broad ridges in the uplands, and of sloping to steep soils on the sides of ridges near drainageways and streams. The area is dissected by many streams that form a dendritic drainage pattern. It is in the eastern part of the county and extends from the Franklin County line to a point near the Johnston County line. The association occupies about 10 percent of the county.

The major soils of this association have formed in material that weathered from granite and gneiss. Deep, well-drained Appling soils make up about 20 percent of the association. They have a surface layer of sandy loam, fine sandy loam, or gravelly sandy loam and a subsoil of clay loam to clay.

Moderately deep, somewhat excessively drained Louisburg soils make up about 20 percent. They have a surface layer of loamy sand that is underlain by very friable sandy loam.

Deep, well-drained Wedowee soils make up about 18 percent of the association. They have a surface layer of sandy loam and a subsoil of firm sandy clay loam to clay loam.

The rest of the association consists mainly of Wake, Durham, Vance, Colfax, Worsham, Chewacla, Wehadkee, and Bibb soils.

About half of this association is cultivated, and the rest is in forest. The farms are generally about 200 acres or less in size. The chief crops are tobacco, cotton, soybeans, and corn.

The soils of this association are suited to tobacco, corn, cotton, soybeans, lespedeza, small grains, and pasture, but they are droughty in many places. The soils are easily tilled but are susceptible to erosion. Crops grown on them respond well if suitable applications of lime and fertilizer are made.

The major soils of this association have moderate to severe limitations to use as absorption fields for septic tanks. They have no special limitations if they are used to support foundation footings for large buildings. Bedrock near the surface is the main limitation to use for road construction.

Wells adequate for industrial use can be located within this association. Yields of 10 to 15 gallons of water per minute are common from private wells. The quantity of surface water is good, and the supply is fairly constant, except during periods of extreme drought.

Descriptions of the Soils

This section describes the soil series and mapping units of Wake County. The approximate acreage and proportionate extent of each mapping unit are given in table 1. Their location in the county is shown on the soil map at the back of this soil survey.

The procedure is first to describe the soil series, and then the mapping units in that series. Thus, to get full information on any mapping unit, it is necessary to read the description of that unit and also the description of the soil series to which it belongs. As mentioned in the section "How This Survey Was Made," not all mapping units are members of a soil series. Gullied land and Made land, for example, are miscellaneous land types that do not belong to a soil series. They are listed, nevertheless, in alphabetic order along with the soil series. The colors shown are those of a moist soil.

In comparing a mapping unit with a soil series, many will prefer to read the short description of the profile in

TABLE 1.—*Approximate acreage and proportionate extent of the soils*

Soil	Acres	Percent
Altavista fine sandy loam, 0 to 4 percent slopes	4,093	0.7
Appling gravelly sandy loam, 2 to 6 percent slopes	3,210	.6
Appling gravelly sandy loam, 2 to 6 percent slopes, eroded	7,130	1.3
Appling gravelly sandy loam, 6 to 10 percent slopes	4,617	.8
Appling gravelly sandy loam, 6 to 10 percent slopes, eroded	8,136	1.5
Appling sandy loam, 2 to 6 percent slopes	16,682	3.0
Appling sandy loam, 2 to 6 percent slopes, eroded	40,724	7.4
Appling sandy loam, 6 to 10 percent slopes	8,470	1.6
Appling sandy loam, 6 to 10 percent slopes, eroded	26,136	4.7
Appling sandy loam, 10 to 15 percent slopes	10,520	1.9
Appling fine sandy loam, 2 to 6 percent slopes	1,261	.2
Appling fine sandy loam, 2 to 6 percent slopes, eroded	2,384	.4
Appling fine sandy loam, 6 to 10 percent slopes	1,216	.2
Appling fine sandy loam, 6 to 10 percent slopes, eroded	1,594	.3
Augusta fine sandy loam	3,876	.7
Buncombe soils	587	.1
Cecil sandy loam, 2 to 6 percent slopes	1,366	.2
Cecil sandy loam, 2 to 6 percent slopes, eroded	19,363	3.5
Cecil sandy loam, 6 to 10 percent slopes	2,043	.4
Cecil sandy loam, 6 to 10 percent slopes, eroded	18,173	3.3
Cecil sandy loam, 10 to 15 percent slopes	15,291	2.8
Cecil sandy loam, 15 to 45 percent slopes	11,214	2.0
Cecil gravelly sandy loam, 2 to 6 percent slopes	1,446	.3
Cecil gravelly sandy loam, 2 to 6 percent slopes, eroded	12,637	2.3
Cecil gravelly sandy loam, 6 to 10 percent slopes	3,006	.5
Cecil gravelly sandy loam, 6 to 10 percent slopes, eroded	16,243	3.0
Cecil clay loam, 2 to 6 percent slopes, severely eroded	1,902	.3
Cecil clay loam, 6 to 10 percent slopes, severely eroded	2,485	.4
Cecil clay loam, 10 to 20 percent slopes, severely eroded	1,286	.2
Chewacla soils	15,950	2.9
Colfax sandy loam	7,797	1.4
Congaree fine sandy loam	2,057	.4
Congaree silt loam	2,294	.4
Creedmoor sandy loam, 2 to 6 percent slopes	2,026	.4
Creedmoor sandy loam, 2 to 6 percent slopes, eroded	11,068	2.0
Creedmoor sandy loam, 6 to 10 percent slopes	3,097	.6
Creedmoor sandy loam, 6 to 10 percent slopes, eroded	14,216	2.6
Creedmoor sandy loam, 10 to 20 percent slopes	6,081	1.1
Creedmoor silt loam, 2 to 6 percent slopes	1,234	.2
Creedmoor silt loam, 6 to 10 percent slopes	1,275	.2
Durham loamy sand, 2 to 6 percent slopes	12,699	2.3
Durham loamy sand, 2 to 6 percent slopes, eroded	851	.1
Durham loamy sand, 6 to 10 percent slopes	2,095	.4
Durham loamy sand, 6 to 10 percent slopes, eroded	716	.1
Enon fine sandy loam, 2 to 6 percent slopes	260	(1)
Enon fine sandy loam, 2 to 6 percent slopes, eroded	987	.2
Enon fine sandy loam, 6 to 10 percent slopes	472	.1
Enon fine sandy loam, 6 to 10 percent slopes, eroded	1,221	.2
Enon fine sandy loam, 10 to 15 percent slopes, eroded	422	.1
Faceville sandy loam, 2 to 6 percent slopes	793	.1
Faceville sandy loam, 2 to 6 percent slopes, eroded	935	.2
Faceville sandy loam, 6 to 10 percent slopes, eroded	186	(1)
Georgeville silt loam, 2 to 6 percent slopes	439	.1
Georgeville silt loam, 2 to 6 percent slopes, eroded	1,720	.3
Georgeville silt loam, 6 to 10 percent slopes	614	0.1
Georgeville silt loam, 6 to 10 percent slopes, eroded	1,555	.3
Georgeville silt loam, 10 to 15 percent slopes, eroded	921	.2
Goldsboro sandy loam	457	.1
Granville sandy loam, 2 to 6 percent slopes	1,317	.2
Granville sandy loam, 2 to 6 percent slopes, eroded	300	.1
Granville sandy loam, 6 to 10 percent slopes	898	.2
Granville sandy loam, 6 to 10 percent slopes, eroded	401	.1
Granville sandy loam, 10 to 15 percent slopes	274	.1
Gullied land	1,447	.3
Helena sandy loam, 2 to 6 percent slopes	217	(1)
Helena sandy loam, 2 to 6 percent slopes, eroded	330	.1
Helena sandy loam, 6 to 10 percent slopes	232	(1)
Helena sandy loam, 6 to 10 percent slopes, eroded	553	.1
Helena sandy loam, 10 to 15 percent slopes	247	(1)
Herndon silt loam, 2 to 6 percent slopes	436	.1
Herndon silt loam, 2 to 6 percent slopes, eroded	1,079	.2
Herndon silt loam, 6 to 10 percent slopes	854	.1
Herndon silt loam, 6 to 10 percent slopes, eroded	1,803	.3
Herndon silt loam, 10 to 15 percent slopes, eroded	1,098	.2
Herndon silt loam, 15 to 25 percent slopes	901	.2
Lloyd loam, 2 to 6 percent slopes, eroded	756	.1
Lloyd loam, 6 to 10 percent slopes, eroded	794	.1
Lloyd loam, 10 to 15 percent slopes, eroded	298	.1
Louisburg loamy sand, 2 to 6 percent slopes	3,104	.6
Louisburg loamy sand, 6 to 10 percent slopes	7,969	1.4
Louisburg loamy sand, 10 to 15 percent slopes	6,411	1.2
Louisburg-Wedowee complex, 2 to 6 percent slopes	1,524	.3
Louisburg-Wedowee complex, 2 to 6 percent slopes, eroded	377	.1
Louisburg-Wedowee complex, 6 to 10 percent slopes	2,597	.5
Louisburg-Wedowee complex, 6 to 10 percent slopes, eroded	986	.2
Lynchburg sandy loam	763	.1
Made land	3,779	.7
Madison sandy loam, 2 to 6 percent slopes, eroded	442	.1
Madison sandy loam, 6 to 10 percent slopes, eroded	1,154	.2
Madison sandy loam, 10 to 15 percent slopes, eroded	951	.2
Madison sandy loam, 15 to 25 percent slopes, eroded	1,352	.2
Mantachie soils	6,260	1.1
Mayodan sandy loam, 2 to 6 percent slopes	580	.1
Mayodan sandy loam, 2 to 6 percent slopes, eroded	950	.2
Mayodan sandy loam, 6 to 10 percent slopes	928	.2
Mayodan sandy loam, 6 to 10 percent slopes, eroded	2,286	.4
Mayodan sandy loam, 10 to 15 percent slopes, eroded	2,497	.5
Mayodan sandy loam, 15 to 25 percent slopes	716	.1
Mayodan gravelly sandy loam, 2 to 6 percent slopes	543	.1
Mayodan gravelly sandy loam, 2 to 6 percent slopes, eroded	1,335	.2
Mayodan gravelly sandy loam, 6 to 10 percent slopes	579	.1
Mayodan gravelly sandy loam, 6 to 10 percent slopes, eroded	1,175	.2
Mayodan silt loam, thin, 2 to 6 percent slopes	987	.2
Mayodan silt loam, thin, 2 to 6 percent slopes, eroded	858	.1
Mayodan silt loam, thin, 6 to 10 percent slopes	1,121	.2
Mayodan silt loam, thin, 6 to 10 percent slopes, eroded	1,164	.2
Mayodan silt loam, thin, 10 to 15 percent slopes	1,852	.3

See footnote at end of table.

TABLE 1.—*Approximate acreage and proportionate extent of the soils*—Continued

Soil	Acres	Percent	Soil	Acres	Percent
Norfolk loamy sand, 0 to 2 percent slopes	1, 246	0. 2	Wedowee sandy loam, 2 to 6 percent slopes, eroded	4, 089	0. 7
Norfolk loamy sand, 2 to 6 percent slopes	8, 103	1. 5	Wedowee sandy loam, 6 to 10 percent slopes	1, 184	. 2
Norfolk loamy sand, 2 to 6 percent slopes, eroded	2, 319	. 4	Wedowee sandy loam, 6 to 10 percent slopes, eroded	3, 981	. 7
Norfolk loamy sand, 6 to 10 percent slopes	1, 137	. 2	Wedowee sandy loam, 10 to 15 percent slopes, eroded	1, 552	. 3
Norfolk loamy sand, 6 to 10 percent slopes, eroded	987	. 2	Wedowee sandy loam, 15 to 25 percent slopes	5, 719	1. 0
Orangeburg loamy sand, 2 to 6 percent slopes	696	. 1	Wehadkee silt loam	7, 431	1. 3
Orangeburg loamy sand, 2 to 6 percent slopes, eroded	777	. 1	Wehadkee and Bibb soils	21, 131	3. 8
Orangeburg loamy sand, 6 to 10 percent slopes, eroded	506	. 1	White Store sandy loam, 2 to 6 percent slopes	512	. 1
Pinkston sandy loam, 0 to 10 percent slopes	533	. 1	White Store sandy loam, 2 to 6 percent slopes, eroded	4, 950	. 9
Pinkston sandy loam, 10 to 45 percent slopes	2, 730	. 5	White Store sandy loam, 6 to 10 percent slopes	793	. 1
Plummer sand	634	. 1	White Store sandy loam, 6 to 10 percent slopes, eroded	7, 215	1. 3
Rains fine sandy loam	1, 328	. 2	White Store sandy loam, 10 to 20 percent slopes	5, 559	1. 0
Roanoke fine sandy loam	1, 475	. 3	White Store silt loam, 2 to 6 percent slopes	351	. 1
Swamp	177	(1)	White Store clay loam, 2 to 15 percent slopes, severely eroded	464	. 1
Vance sandy loam, 2 to 6 percent slopes	609	. 1	Wilkes soils, 2 to 10 percent slopes	659	. 1
Vance sandy loam, 2 to 6 percent slopes, eroded	2, 037	. 4	Wilkes soils, 10 to 20 percent slopes	847	. 1
Vance sandy loam, 6 to 10 percent slopes, eroded	1, 179	. 2	Wilkes soils, 20 to 45 percent slopes	4, 520	. 8
Wagram loamy sand, 0 to 2 percent slopes	1, 445	. 3	Wilkes stony soils, 15 to 25 percent slopes	235	(1)
Wagram loamy sand, 2 to 6 percent slopes	10, 086	1. 8	Worsham sandy loam	12, 613	2. 3
Wagram loamy sand, 6 to 10 percent slopes	4, 894	. 9	Borrow area	346	. 1
Wagram-Troup sands, 0 to 4 percent slopes	4, 434	. 8	Total	552, 960	100. 0
Wahee fine sandy loam	892	. 2			
Wake soils, 2 to 10 percent slopes	906	. 2			
Wake soils, 10 to 25 percent slopes	7, 226	1. 3			
Wedowee sandy loam, 2 to 6 percent slopes	1, 449	. 3			

[1] Less than 0.05 percent.

paragraph form under the description of the mapping unit. It differs from the technical description in that it is less detailed and does not identify layers by A, B, C, and R horizons and depth ranges. The technical profile descriptions are mainly for soil scientists and others who want detailed information about soils (*15*).[2]

Following the name of each mapping unit, there is a symbol in parentheses. This symbol identifies the mapping unit on the detailed soil map. Listed at the end of each description of a mapping unit is the capability unit, woodland suitability group, and wildlife suitability group in which the mapping unit has been placed. The page on which each capability unit is described can be found by referring to the "Guide to Mapping Units" at the back of this survey. Many terms used in the soil descriptions and in other parts of the survey are defined in the Glossary.

Altavista Series

The Altavista series consists of nearly level and gently sloping, deep, moderately well drained soils on low stream terraces. The areas are fairly large and are near the major streams in the county. The soils have formed in alluvial deposits under forest vegetation. A seasonal high water table is at a depth of approximately 2 feet.

Natural fertility and the content of organic matter are low. Permeability is moderate, the available water capacity is medium, and the shrink-swell potential is moderate. Infrequent flooding occurs, but the floodwaters remain for only short periods. Reaction is medium acid to strongly acid in areas that have not been limed. Response is good if a suitable amount of lime and the proper kinds and amounts of fertilizer are applied.

Their limited extent makes the Altavista soils of only minor importance for farming. Most of the acreage is cultivated or in pasture.

Representative profile of Altavista fine sandy loam, 0 to 4 percent slopes, in a cultivated field 1½ miles southwest of Plymouth Church and 200 yards east of farm road:

Ap—0 to 10 inches, light brownish-gray (10YR 6/2) fine sandy loam; weak, medium, granular structure; very friable when moist; many fine, woody and fibrous roots; medium acid; abrupt, wavy boundary.

A2—10 to 13 inches, pale-brown (10YR 6/3) fine sandy loam; weak, fine, granular structure; very friable when moist; few, fine, woody roots; medium acid; abrupt, smooth boundary.

B1—13 to 15 inches, brownish-yellow (10YR 6/6) and pale-brown (10YR 6/3) fine sandy clay loam; weak, fine, subangular blocky structure; friable when moist; few, medium, woody roots; medium acid; abrupt, wavy boundary.

B21t—15 to 19 inches, yellowish-brown (10YR 5/6) clay loam; moderate, medium, subangular blocky structure; friable when moist; discontinuous clay films; medium acid; clear, smooth boundary.

B22t—19 to 29 inches, yellowish-brown (10YR 5/8) clay loam; common, fine, distinct, yellowish-red mottles; moderate, medium, subangular blocky structure; friable to firm when moist; discontinuous clay films on ped surfaces; medium acid; clear, smooth boundary.

B23t—29 to 36 inches, yellowish-brown (10YR 5/8) clay loam; common, fine, distinct, light brownish-gray mottles; weak, fine, subangular blocky structure; friable when moist; few discontinuous clay films; strongly acid; gradual, smooth boundary.

[2] Italic numbers in parentheses refer to Literature Cited, p. 117.

B3—36 to 42 inches, brownish-yellow (10YR 6/6) sandy clay loam; many, medium, distinct, light brownish-gray mottles; weak, fine, subangular blocky structure; friable when moist; few, thin, discontinuous clay films; strongly acid; gradual, smooth boundary.

C—42 to 48 inches +, yellowish-brown (10YR 5/8) coarse sandy loam; many, medium, distinct, strong-brown and light grayish-brown mottles; massive; friable when moist; strongly acid.

The A horizons range from 3 to 15 inches in total thickness and from light brownish gray or pale brown to light grayish brown or dark grayish brown in color. The B horizons range from 12 to 29 inches in combined thickness and from sandy clay loam to clay loam in texture. Their color ranges from yellowish brown or brownish yellow to reddish yellow in 10YR or 7.5YR hues. Grayish mottles are 10 to 20 inches below the top of the B21t horizon. The combined thickness of the surface layer and subsoil ranges from 24 inches to less than 60 inches. Depth to hard rock is more than 5 feet and commonly is more than 15 feet.

Altavista soils occur with Appling, Goldsboro, Colfax, and Augusta soils. They are less well drained than the Appling soils, have a thinner solum than the Goldsboro soils, and are better drained than the Colfax and Augusta soils.

Altavista fine sandy loam, 0 to 4 percent slopes (AfA).—This is the only Altavista soil mapped in Wake County. It is on low stream terraces. The surface layer is light brownish-gray and light grayish-brown to dark grayish-brown fine sandy loam 3 to 15 inches thick. The subsoil is yellowish-brown to reddish-yellow, friable sandy clay loam to clay loam mottled with gray in most places. It is 12 to 29 inches thick.

Infiltration is good, and surface runoff is slow to medium. This soil is easy to keep in good tilth and can be worked throughout a wide range of moisture content.

This soil is well suited to most of the locally grown crops. It is used mainly for row crops or pasture, but a small acreage is in trees. In places some improvement in drainage is needed if tobacco and specialty crops are grown. (Capability unit IIw–1, woodland suitability group 4, wildlife suitability group 1)

Appling Series

Gently sloping to strongly sloping, deep, well-drained soils of the Piedmont uplands make up the Appling series. These soils are on side slopes and on rounded divides that have a difference in elevation of about 50 feet between the highest and the lowest points. They have formed under forest in material that weathered from granite, gneiss, schist, and other acidic rocks. Large areas are in the eastern part of the county, and smaller areas are in other parts.

Natural fertility and the content of organic matter are low. The available water capacity is medium, and permeability and the shrink-swell potential are moderate. Except in areas that have received lime, these soils are strongly acid. Response is good if suitable applications of lime and fertilizer are made.

Appling soils are suited to all the locally grown crops. Much of the acreage is cultivated.

Representative profile of an Appling sandy loam in a cultivated field 1 mile north of Bethany Church on a paved road, one-eighth of a mile east on a private road, and 20 yards south of private road.

Ap—0 to 8 inches, grayish-brown (10YR 5/2) sandy loam; weak, coarse, granular structure; very friable when moist; many, fine, fibrous roots; medium acid; clear, smooth boundary.

A2—8 to 11 inches, light yellowish-brown (10YR 6/4) sandy loam; weak, coarse, granular structure; very friable when moist; common, fine, fibrous roots; medium acid; clear, smooth boundary.

B1—11 to 14 inches, strong-brown (7.5YR 5/6) sandy clay loam; weak, medium, subangular blocky structure; friable when moist, sticky and slightly plastic when wet; few fine mica flakes; few quartz pebbles; strongly acid; abrupt, smooth boundary.

B21t—14 to 20 inches, strong-brown (7.5YR 5/6) clay loam; few, fine, distinct, yellow mottles; moderate, fine and medium, subangular blocky structure; firm when moist, sticky and plastic when wet; few thin clay films; strongly acid; clear, smooth boundary.

B22t—20 to 25 inches, strong-brown (7.5YR 5/6) clay loam; few, fine, distinct, brownish-yellow and common, fine, prominent, red mottles; moderate, fine and medium, subangular blocky structure; firm when moist, sticky and plastic when wet; thin clay films on ped surfaces; few fine mica flakes; strongly acid; clear, smooth boundary.

B23t—25 to 37 inches, reddish-yellow (7.5YR 6/6) clay loam; few, fine, distinct, red mottles; moderate, fine and medium, subangular blocky structure; friable when moist, sticky and plastic when wet; thin clay films on ped surfaces; few fine mica flakes; strongly acid; clear, smooth boundary.

B24t—37 to 39 inches, yellowish-brown (10YR 5/6) clay loam; common, medium, prominent, red mottles; weak and moderate, fine, subangular blocky structure tending to massive; friable when moist, sticky and plastic when wet; few clay films in vertical cracks; some saprolite; common to many mica flakes; strongly acid; clear, smooth boundary.

B3—39 to 44 inches, red (2.5YR 5/8) loam; common, fine, distinct, brownish-yellow mottles; weak, medium, subangular blocky structure tending to massive; friable when moist, slightly sticky and slightly plastic when wet; few clay films in vertical cracks; many mica flakes; strongly acid; clear, smooth boundary.

C—44 to 50 inches +, mottled red and brownish-yellow sandy clay loam saprolite containing many mica flakes; strongly acid.

The A horizons range from dark gray or dark grayish brown to light grayish brown or light yellowish brown in color and from 3 to 30 inches in total thickness. In general, their texture ranges from sandy loam or fine sandy loam to gravelly sandy loam that contains cobblestones in places. In more eroded areas, however, the texture ranges to sandy clay. The B horizons range from loam to clay in texture and from 24 to 40 inches in total thickness. The B1 horizon is commonly yellowish brown instead of strong brown. The B2 horizons are generally mottled with red, and their color ranges from yellowish brown or strong brown to yellowish red or reddish yellow in hues of 10YR to 5YR. The color of the B3 horizon ranges from red to yellowish red, and that horizon is streaked with gray in places. The combined thickness of the surface layer and subsoil ranges from 36 to 60 inches. Depth to hard rock ranges from 5 to more than 15 feet.

Appling soils occur with Herndon, Durham, Cecil, Vance, and Mayodan soils. They contain more sand and less silt than the Herndon soils and contain more clay and are more reddish than the Durham soils. Appling soils are less red and less clayey than the Cecil soils, are less firm than the Vance soils, and contain less exchangeable aluminum than the Mayodan soils.

Appling gravelly sandy loam, 2 to 6 percent slopes (AgB).—This soil is on broad, smooth interstream divides in the uplands. It has a surface layer of light grayish-brown to dark-gray gravelly sandy loam that is 6 to 20 inches thick. The subsoil is yellowish-brown to yellowish-

red, firm clay loam to clay that is mottled with red in most places and is 24 to 40 inches thick. From 15 to 30 percent of the surface layer is gravel. In many places cobbles are on and in the surface layer. Included in mapping were a few areas where the slope is less than 2 percent.

Infiltration is good, and surface runoff is medium. The hazard of erosion is moderate. This soil can be worked throughout a wide range of moisture content, but where the content of gravel and cobblestones is high, tillage is difficult.

About half of the acreage is in cultivated crops or pasture, and the rest is in forest or in other uses. The cultivated areas are used chiefly for row crops, but this soil is well suited to all the locally grown crops. Practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIe–1, woodland suitability group 5, wildlife suitability group 1)

Appling gravelly sandy loam, 2 to 6 percent slopes, eroded (AgB2).—This soil is on broad, smooth interstream divides in the uplands. The surface layer is 3 to 7 inches thick, and in many places it is a mixture of the remaining original surface soil and of material from the subsoil. In the less eroded areas, the surface layer is light grayish-brown gravelly sandy loam, but in the more eroded spots the color ranges to yellowish brown and the texture ranges to gravelly sandy clay. The subsoil is 24 to 40 inches thick and is yellowish-brown to yellowish-red, firm clay loam to clay that is mottled with red in many places.

Included with this soil in mapping were some severely eroded spots where the subsoil is exposed. These areas make up from 5 to 25 percent of the acreage in the mapping unit.

Infiltration is fair, and surface runoff is medium. The hazard of further erosion is moderate. This soil is difficult to keep in good tilth, but it can be worked throughout a fairly wide range of moisture content. A crust forms on the severely eroded spots after hard rains, and clods form there if those areas are worked when wet. The crust and the clods interfere with germination. As a result, stands of crops are poor and replanting of those areas may be necessary. An even stand of tobacco is hard to obtain. Plants in an uneven stand mature at different times. This increases the difficulty of harvesting and curing the crop, and it reduces the quality of the tobacco.

About half of the storage is cultivated or in pasture, and the rest is in forest or in other uses. The cultivated areas are used chiefly for row crops, but this soil is well suited to all the locally grown crops. Practices that effectively control runoff and erosion are needed in the cultivated areas. Capability unit IIe–1, woodland suitability group 5, wildlife suitability group 1)

Appling gravelly sandy loam, 6 to 10 percent slopes (AgC).—This soil is on narrow side slopes in the uplands. Its surface layer is light grayish-brown to dark-gray gravelly sandy loam 6 to 15 inches thick. The content of gravel in the surface layer ranges from 15 to 30 percent. The subsoil is 24 to 36 inches thick and is yellowish-brown to yellowish-red, firm clay loam to clay mottled with red in many places. In many areas cobblestones are on the surface and in the surface layer.

Infiltration is good, and surface runoff is rapid. The hazard of erosion is severe. This soil can be worked throughout a wide range of moisture content. It is difficult to till, however, in areas where the content of gravel and cobblestones is high.

About one-fourth of the acreage is in cultivated crops or pasture, and the rest is in forest or in other uses. Where this soil has been cleared, it is used chiefly for row crops, but is is well suited to all the locally grown crops. Intensive practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIIe–1, woodland suitability group 5, wildlife suitability group 1)

Appling gravelly sandy loam, 6 to 10 percent slopes, eroded (AgC2).—This soil is on narrow side slopes in the uplands. In many places its surface layer is a mixture of the remaining original surface soil and of material from the subsoil. The surface layer is 3 to 7 inches thick and ranges from light grayish-brown gravelly sandy loam in the less eroded spots to yellowish-brown gravelly sandy clay in the more eroded areas. The subsoil is 24 to 36 inches thick and is yellowish-brown to yellowish-red, firm clay loam to clay that is mottled with red in most places. In many places cobbles are in the surface layer and on the surface.

Included in mapping were some severely eroded spots where the subsoil is exposed. These areas make up from 5 to 25 percent of the acreage in the mapping unit.

Infiltration is fair, and surface runoff is rapid. The hazard of further erosion is severe. The large number of pebbles and cobblestones, and the thin surface layer, make this soil difficult to keep in good tilth, but the soil can be worked throughout a fairly wide range of moisture content. A crust forms on the severely eroded spots after hard rains, and clods form if those areas are worked when wet. The crust and the clods interfere with germination. As a result, stands of crops are poor and replanting is sometimes necessary. An even stand of tobacco is hard to obtain. Plants in an uneven stand mature at different times. This increases the difficulty of harvesting and curing the crop, and it reduces the quality of the tobacco.

About one-fourth of the acreage is cultivated, and the rest is in forest. This soil is well suited to all the locally grown crops, and the areas that are cleared are used chiefly for row crops. Intensive practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIIe–1, woodland suitability group 5, wildlife suitability group 1)

Appling sandy loam, 2 to 6 percent slopes (ApB).—This soil is on broad, smooth interstream divides in the uplands. Its surface layer is light grayish-brown to dark-gray sandy loam 8 to 20 inches thick (fig. 2). The subsoil is 24 to 40 inches thick and is yellowish-brown to yellowish-red, firm clay loam to clay that is mottled with red in many places. Included in mapping were a few areas in which the slope is less than 2 percent.

Infiltration is good, and surface runoff is medium. The hazard of erosion is moderate. This soil is easy to keep in good tilth and can be worked throughout a wide range of moisture content.

About two-thirds of the acreage is cultivated or in pasture, and the rest is in forest or in other uses. The cultivated areas are used chiefly for row crops, especially tobacco and cotton, but this soil is well suited to all the locally grown crops. Practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIe–1, woodland suitability group 5, wildlife suitability group 1)

Appling sandy loam, 2 to 6 percent slopes, eroded (ApB2).—This soil is on broad, smooth interstream divides in the uplands. The surface layer is 3 to 7 inches thick, and in places it is a mixture of the remaining original surface soil and of material from the subsoil. In the less eroded areas, the surface layer is light grayish-brown sandy loam, but the color ranges to yellowish brown and the texture ranges to sandy clay in the more eroded spots. The subsoil is 24 to 40 inches thick, and it is yellowish-brown to yellowish-red, firm sandy clay loam to clay that is mottled with red in many places.

Included with this soil in mapping were some severely eroded spots where the subsoil is exposed. These areas make up from 5 to 25 percent of the acreage in the mapping unit.

Infiltration is fair, and surface runoff is medium. The hazard of further erosion is moderate. This soil is easy to keep in good tilth and can be worked throughout a wide range of moisture content. A crust forms on the severely eroded spots after hard rains, however, and clods form if those areas are worked when wet. The crust and the clods interfere with germination. As a result, stands of crops are poor and replanting of the severely eroded spots may be necessary. An even stand of tobacco is hard to obtain. Plants in an uneven stand mature at different times. This increases the difficulty of harvesting and curing the crop and reduces the quality of the tobacco.

About two-thirds of the acreage is in cultivated crops or pasture, and the rest is in forest or in other uses. The cultivated areas are used chiefly for row crops, especially tobacco and cotton, but this soil is well suited to all the locally grown crops. In the areas that are cultivated, practices that effectively control runoff and erosion are needed. (Capability unit IIe–1, woodland suitability group 5, wildlife suitability group 1)

Appling sandy loam, 6 to 10 percent slopes (ApC).—This soil is on narrow side slopes in the uplands. It has a surface layer of light grayish-brown to dark-gray sandy loam 7 to 15 inches thick. The subsoil is yellowish-brown to yellowish-red, firm clay loam to clay that is mottled with red in most places. The subsoil is 24 to 36 inches thick.

Infiltration is good, and surface runoff is rapid. The hazard of erosion is severe. This soil is easy to keep in good tilth and can be worked throughout a wide range of moisture content.

About two-thirds of the acreage is in cultivated crops or pasture, and the rest is in forest or in other uses. The cultivated areas are used chiefly for row crops, especially tobacco and cotton, but this soil is well suited to all the locally grown crops. Intensive practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIIe–1, woodland suitability group 5, wildlife suitability group 1)

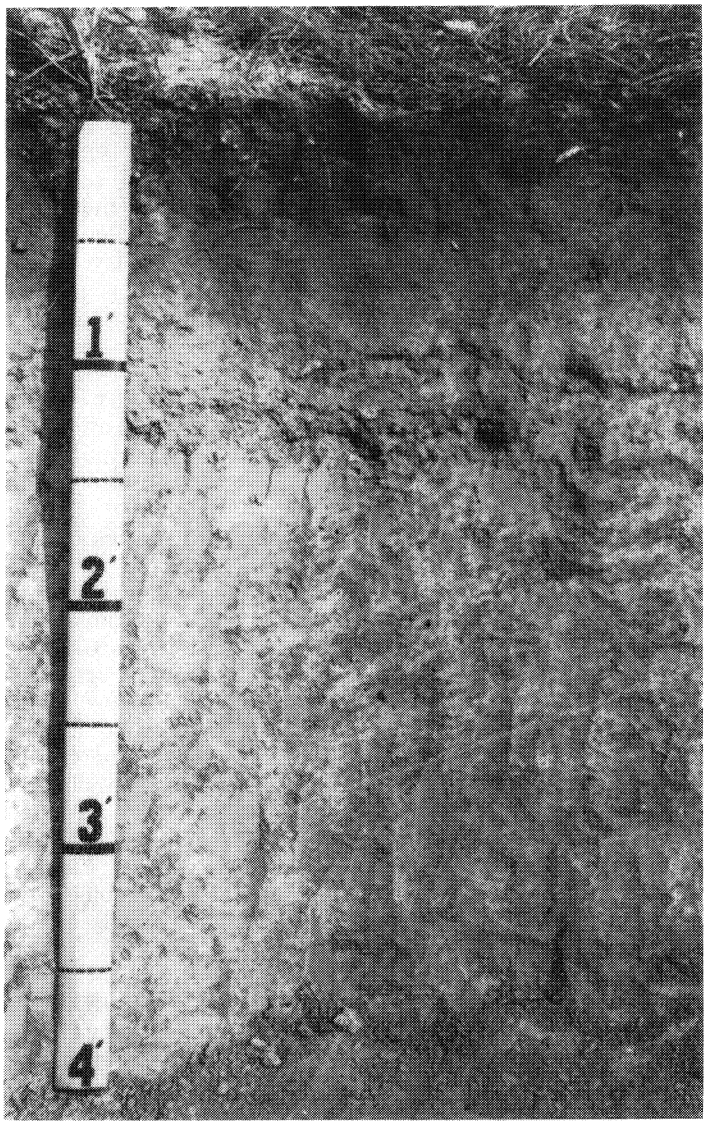

Figure 2.—**Profile of Appling sandy loam, 2 to 6 percent slopes.**

Appling sandy loam, 6 to 10 percent slopes, eroded (ApC2).—This soil is on narrow side slopes in the uplands. In many places the present surface layer is a mixture of the remaining original surface soil and of material from the subsoil. In the less eroded spots, the surface layer is light grayish-brown sandy loam. In the more eroded spots, the color ranges to yellowish brown and the texture ranges to sandy clay. Thickness of the surface layer ranges from 3 to 7 inches. The subsoil is 24 to 36 inches thick and is yellowish-brown to yellowish-red, firm clay loam to clay that is mottled with red in most places.

Included with this soil in mapping were some severely eroded spots where the subsoil is exposed. These areas make up from 5 to 25 percent of the total acreage in the mapping unit.

Infiltration is fair, and surface runoff is rapid. The hazard of further erosion is severe. This soil is difficult

to keep in good tilth, but it can be worked throughout a fairly wide range of moisture content. A crust forms on the severely eroded spots after hard rains, however, and clods form if those areas are worked when wet. The crust and the clods interfere with germination. As a result, stands of crops are poor and replanting is sometimes necessary. An even stand of tobacco is hard to obtain in those areas. Plants in an uneven stand mature at different times. This increases the difficulty of harvesting and curing the crop and reduces the quality of the tobacco.

About one-third of the acreage is cultivated or in pasture, and the rest is in forest or in other uses. The cultivated areas are used chiefly for row crops, especially tobacco and cotton, but this soil is well suited to all the locally grown crops. Intensive practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIIe–1, woodland suitability group 5, wildlife suitability group 1)

Appling sandy loam, 10 to 15 percent slopes (ApD).—This soil is on narrow side slopes bordering drainageways in the uplands. Some slight or moderate erosion has taken place. In the slightly eroded areas, the surface layer is light grayish-brown to dark-gray sandy loam 7 to 12 inches thick. In the moderately eroded areas, the surface layer ranges from light grayish-brown sandy loam to yellowish-brown sandy clay and is 3 to 7 inches thick. The subsoil is 24 to 30 inches thick and consists of yellowish-brown to yellowish-red, firm clay loam to clay that is mottled with red in most places. In many areas pebbles and cobblestones are on and in the surface layer.

Included with this soil in mapping were some areas where the surface layer is fine sandy loam, and some severly eroded spots where the subsoil is exposed. Also included were a few areas of Durham loamy sand.

Infiltration is fair to good, and surface runoff is very rapid. The hazard of further erosion is very severe. Where this soil is only slightly eroded, it is easy to keep in good tilth. Where is is moderately eroded, it is difficult to keep in good tilth, but it can be worked throughout a fairly wide range of moisture content. A crust forms on the severely eroded spots after hard rains, and clods form if those areas are worked when wet. The crust and the clods interfere with germination. As a result, stands of crops are poor and replanting of the severely eroded spots may be necessary.

About one-third of the acreage is cultivated or in pasture, and the rest is in forest. The cultivated areas are used chiefly for row crops, but this soil is suited to all the locally grown crops. Intensive practices that effectively control runoff and erosion are necessary if cultivated crops are grown. (Capability unit IVe–1, woodland suitability group 5, wildlife suitability group 1)

Appling fine sandy loam, 2 to 6 percent slopes (AsB).—This soil is on broad, smooth interstream divides in the uplands. It has a surface layer of light grayish-brown to dark-gray fine sandy loam 6 to 12 inches thick. The subsoil is 24 to 40 inches thick and is yellowish-brown to yellowish-red, firm clay loam to clay that is mottled with red in most places. A few areas where the slopes are less than 2 percent were included in the mapping.

Infiltration is good, and surface runoff is medium. The hazard of erosion is moderate. This soil is easily kept in good tilth and can be worked throughout a wide range of moisture content.

About two-thirds of the acreage is cultivated or in pasture, and the rest is in forest. The cultivated areas are used chiefly for row crops, but this soil is well suited to all the locally grown crops. Where cultivated crops are grown, practices that effectively control runoff and erosion are needed. (Capability unit IIe–1, woodland suitability group 5, wildlife suitability group 1)

Appling fine sandy loam, 2 to 6 percent slopes, eroded (AsB2).—This soil is on broad, smooth interstream divides in the uplands. In places its surface layer is a mixture of the remaining original surface soil and of material from the subsoil. In the less eroded spots, the surface layer is light grayish-brown fine sandy loam, but in the more eroded spots the color ranges to yellowish brown and the texture ranges to sandy clay. Thickness of the surface layer ranges from 3 to 7 inches. The subsoil is 24 to 40 inches thick and is yellowish-brown to yellowish-red, firm clay loam to clay that is mottled with red in most places.

Included with this soil in mapping were some severely eroded spots where the subsoil is exposed. These areas make up from 5 to 25 percent of the total acreage in the mapping unit. Also included were areas of a soil that has a slightly more brownish color and probably a higher base saturation than this Appling soil.

Infiltration is fair, and surface runoff is medium. The hazard of further erosion is moderate. This soil can be worked throughout a fairly wide range of moisture content. A crust forms on the severely eroded spots after hard rains, however, and clods form if those areas are worked when wet. The crust and the clods interfere with germination. As a result, stands of crops are poor and replanting of these areas is sometimes necessary. An even stand of tobacco is hard to obtain in these areas. Plants in an uneven stand mature at different times. This increases the difficulty of harvesting and curing the crop, and it reduces the quality of the tobacco.

About two-thirds of the acreage is cultivated or in pasture, and the rest is in forest. The cultivated areas are used chiefly for row crops, but this soil is well suited to all the locally grown crops. Practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIe–1, woodland suitability group 5, wildlife suitability group 1)

Appling fine sandy loam, 6 to 10 percent slopes (AsC).—This soil is on narrow side slopes in the uplands. It has a surface layer of light grayish-brown to dark-gray fine sandy loam 6 to 12 inches thick. The subsoil is 24 to 36 inches thick and is yellowish-brown to yellowish-red, firm clay loam to clay that is mottled with red in most places. Included in mapping were areas of a soil that has a slightly more brownish color and probably a higher base saturation than this soil.

Infiltration is good, and surface runoff is rapid. The hazard of erosion is severe. This soil is easy to keep in good tilth and can be worked throughout a wide range of moisture content.

About half of the acreage is cultivated or in pasture, and the rest is in forest. The cultivated areas are used

chiefly for row crops, but this soil is well suited to all the locally grown crops. Intensive practices that effectively control runoff and erosion are necessary in the cultivated areas. (Capability unit IIIe–1, woodland suitability group 5, wildlife suitability group 1)

Appling fine sandy loam, 6 to 10 percent slopes, eroded (AsC2).—This soil is on narrow side slopes in the uplands. In many places its surface layer is a mixture of the remaining original surface soil and of material from the subsoil. The surface layer is 3 to 7 inches thick and ranges from light grayish-brown fine sandy loam, in the less eroded areas, to yellowish-brown sandy clay, in the more eroded spots. The subsoil is 24 to 36 inches thick and is yellowish-brown to yellowish-red, firm clay loam to clay that is mottled with red in many places.

Included in mapping were some severely eroded spots where the subsoil is exposed. These areas make up from 5 to 25 percent of the acreage in the mapping unit. Also included were areas of a soil that has a slightly more brownish color and probably a higher base saturation than this soil.

Infiltration is fair, and surface runoff is rapid. The hazard of further erosion is severe. This soil is difficult to keep in good tilth, but it can be worked throughout a fairly wide range of moisture content. A crust forms on the severely eroded spots after hard rains, however, and clods form if those areas are worked when wet. The crust and the clods interfere with germination. As a result, stands of crops are poor and replanting of the severely eroded spots is sometimes necessary. An even stand of tobacco is hard to obtain. Plants in an uneven stand mature at different times. This increases the difficulty of harvesting and curing the crops and reduces the quality of the tobacco.

About one-fourth of the acreage is cultivated or in pasture, and the rest is in forest or in other uses. The cultivated areas are used chiefly for row crops, but this soil is well suited to all the locally grown crops. Intensive practices that effectively control runoff and erosion are necessary in the cultivated areas. (Capability unit IIIe–1, woodland suitability group 5, wildlife suitability group 1)

Augusta Series

The Augusta series consists of nearly level and gently sloping soils that are deep and somewhat poorly drained. These soils are on low stream terraces near the large streams in the county. They have formed in alluvial deposits under forest. A seasonally high water table is at a depth of 1½ feet.

Natural fertility and the content of organic matter are low, permeability is moderately slow, and the available water capacity is medium. The shrink-swell potential is moderate. These soils are frequently flooded, but the floodwaters remain for only a short period of time. Except in areas that have received lime, these soils are very strongly acid. Response is fairly good if suitable applications of lime and fertilizer are made.

Augusta soils are of only minor importance for farming. Most of the acreage is in hardwood forests, but some areas are used for pasture. Only a small acreage is cultivated.

Representative profile of Augusta fine sandy loam in a hardwood forest 200 feet south of Swift Creek and one-half mile west of Old Stage Road:

A1—0 to 6 inches, dark grayish-brown (10YR 4/2) fine sandy loam; weak, medium, granular structure; very friable when moist; many fine and medium, woody and fibrous roots; many fine pores; strongly acid; abrupt, smooth boundary.

A2—6 to 13 inches, pale-brown (10YR 6/3) fine sandy loam; few, fine, distinct, brownish-yellow and many, medium, prominent, dark yellowish-brown mottles; weak, medium, granular structure; very friable when moist; common, fine and medium, woody roots; many fine pores; few fine mica flakes; strongly acid; clear, wavy boundary.

B1—13 to 16 inches, pale-brown (10YR 6/3) heavy sandy loam; common, fine, distinct, brownish-yellow mottles and many, medium, prominent, gray mottles; weak, medium, subangular blocky structure tending to massive; very friable when moist, slightly sticky and slightly plastic when wet; many fine pores; thin clay films; very strongly acid; clear, smooth boundary.

B21t—16 to 24 inches, yellowish-brown (10YR 5/8) sandy clay loam; many, medium, prominent, light-gray mottles; moderate, medium and coarse, subangular blocky structure; friable when moist, slighty sticky and slightly plastic when wet; few, fine and medium, woody roots; many fine pores; thin clay films on ped surfaces; very strongly acid; clear, wavy boundary.

B22t—24 to 36 inches, reddish-yellow (7.5YR 6/8) sandy clay loam; many, medium, prominent, light-gray mottles; weak, medium, subangular blocky structure; friable when moist, slightly sticky and slightly plastic when wet; few, medium, woody roots; common fine pores; thin clay films on ped surfaces; very strongly acid; gradual, smooth boundary.

B3—36 to 43 inches, light-gray (2.5Y 7/2) heavy fine sandy loam; many coarse, prominent, yellowish-brown (10YR 5/8) mottles; massive; friable when moist, sticky and slightly plastic when wet; few, fine, woody roots; many fine pores; strongly acid; clear, smooth boundary.

C—43 to 50 inches +, gray (10YR 6/1) sandy loam; few, fine, prominent, yellowish-red mottles; massive; very friable when moist, nonsticky and nonplastic when wet; common fine pores; medium acid.

The A horizons range from 6 to 15 inches in total thickness, and from dark gray or dark grayish brown to pale brown in color. The B horizons range from 10 to 30 inches in total thickness and from sandy loam to clay loam in texture. Their color ranges from pale brown to reddish yellow mottled with gray. The gray colors increase with depth, and the lower part of the profile is mostly gray or is entirely gray. The subsoil has weak to moderate, fine to medium, subangular blocky structure. The combined thickness of the surface layer and subsoil ranges from 18 to 43 inches. Depth to bedrock ranges from 5 to more than 15 feet.

Augusta soils occur with Altavista and Wahee soils. They are less well drained than the Altavista soils and lack the firm, clayey subsoil that is typical of the Wahee soils.

Augusta fine sandy loam (0 to 4 percent slopes) (Au).—This is the only soil of the Augusta series mapped in Wake County. It is on low terraces. The surface layer is dark-gray to pale-brown fine sandy loam, and it has a total thickness of 6 to 15 inches. The subsoil is pale-brown to reddish-yellow, friable sandy clay loam to clay loam mottled with gray, and it is 10 to 28 inches thick.

Infiltration is good, and surface runoff is slow to medium. If this soil is drained, it is easy to keep in good

tilth and can be worked throughout a wide range of moisture content.

Most of the acreage is in forest, but some areas are in pasture or are cultivated. If this soil is properly drained, it is suited to most of the locally grown crops. Adequate drainage is required, however, for it to be well suited to row crops. The areas that have been cleared are used chiefly for pasture. (Capability unit IIIw–2, woodland suitability group 4, wildlife suitability group 2)

Bibb Series

In the Bibb series are soils that are poorly drained and nearly level or gently sloping. These soils are on the flood plains of streams and in depressions and draws in the uplands. They have formed in coarse loamy alluvium and in local alluvium. A seasonally high water table is at the surface.

Natural fertility and the content of organic matter are low. Permeability is moderate to moderately rapid, and the available water capacity and the shrink-swell potential are low. These soils are frequently flooded for long periods of time. Except in areas that have received lime, they are strongly acid. Response is fairly good if suitable applications of lime and fertilizer are made.

Bibb soils are not important for farming. Practically all of the acreage is in mixed hardwoods and pines. In this county the Bibb soils are mapped only in an undifferentiated unit with Wehadkee soils.

Representative profile of a Bibb sandy loam in a wooded area three-fourths of a mile south of F.C. Pearce Store, 45 yards west of county road, and 25 yards north of a creek:

O1—1½ inches to 0, undecomposed forest litter.
A11—0 to 6 inches, grayish-brown (2.5Y 5/2) sandy loam; many, fine, prominent, yellowish-red mottles; moderate, fine and medium, granular structure; very friable when moist; many fine, woody and fibrous roots; common fine mica flakes; medium acid; abrupt, wavy boundary.
A12—6 to 9 inches, very pale brown (10YR 7/4) coarse sand; few, fine, prominent, reddish-yellow mottles; single grain; loose when moist; few, fine, woody and fibrous roots; medium acid; abrupt, wavy boundary.
B21g—9 to 20 inches, grayish-brown (2.5Y 5/2) fine sandy loam; few, fine, prominent, yellowish-red and common, medium, faint, light-gray mottles; structureless; very friable when moist, slightly sticky and slightly plastic when wet; few, fine, woody and fibrous roots; many fine mica flakes; strongly acid; abrupt, wavy boundary.
B22g—20 to 36 inches, grayish-brown (10YR 5/2) sandy loam; structureless; very friable when moist, nonsticky and nonplastic when wet; common fine mica flakes; strongly acid; abrupt, wavy boundary.
Cg—36 to 42 inches +, gray (10YR 5/1) sand containing lenses of very fine sandy loam ¼ to ½ inch thick; single grain; loose when moist; (the very fine sandy loam is massive and is very friable when moist); many fine mica flakes; slightly acid.

The A horizons range from 4 to 12 inches in total thickness, from grayish brown to very dark grayish brown or very pale brown in color, and from sandy loam to coarse sand in texture. The B horizons are variable in color and texture. Their color ranges from light brownish gray to black mottled with gray and brown, and their texture ranges from sandy loam to loam. These soils are massive or single grain and are very friable to loose. The combined thickness of their surface layer and subsoil is about 36 inches. Depth to bedrock ranges from 4 to more than 15 feet.

Borrow area, identified by name on the soil map, is a miscellaneous land type consisting of areas where the soils have been excavated to a depth of several feet. The more recent areas of this land type are bare and are subject to accelerated erosion. The older areas are eroded. Where pines and other plants are growing, however, many of the older areas are somewhat stabilized.

The Borrow areas are not extensive, but small areas are scattered throughout the county.

This miscellaneous land type is so variable that the areas require onsite investigation to see if they are suitable for the intended use. (Not placed in a capability unit; woodland suitability group 13, wildlife suitability group 5)

Buncombe Series

The Buncombe series consists of nearly level, somewhat excessively drained soils on flood plains of the large streams in the county. These soils have formed in sandy alluvial deposits. They have a seasonally high water table at a depth of approximately 2½ feet.

Natural fertility and the content of organic matter are very low, and permeability is rapid. The available water capacity and the shrink-swell potential are low. These soils are frequently flooded, but the floodwaters remain for only a brief period of time. Except in areas that have received lime, reaction is strongly acid. Response is moderately good if suitable applications of lime and fertilizer are made.

Buncombe soils are not important for farming. They are mostly in forest, but a small acreage is cultivated or in pasture.

Representative profile of a Buncombe loamy sand in a cultivated field 4 miles southeast of Shotwell, 25 yards south of a creek, and 50 yards northwest of the Johnston County line:

Ap—0 to 10 inches, dark grayish-brown (10YR 4/2) loamy sand; single grain; loose when moist; many, fine and medium, woody roots; few fine mica flakes; strongly acid; abrupt, smooth boundary.
C1—10 to 25 inches, light yellowish-brown (10YR 6/4) sand; single grain; loose when moist; common, fine, woody roots; few fine mica flakes; strongly acid; abrupt, smooth boundary.
C2—25 to 33 inches, light yellowish-brown (10YR 6/4) sand; common streaks of dark yellowish brown (10YR 4/4) that are one-fourth of an inch or less thick; single grain; loose when moist; few medium mica flakes; strongly acid; abrupt, smooth boundary.
C3—33 to 40 inches +, pale-brown (10YR 6/3) sand; single grain; loose when moist; few medium mica flakes; strongly acid; abrupt, smooth boundary.

The A horizon ranges from 4 to 10 inches in thickness, from dark grayish brown to pale brown in color, and from sand to loamy sand in texture. The total thickness of the C horizons ranges from 30 to more than 36 inches. The C horizons range from pale brown to yellowish brown in color and from sand to loamy sand in texture. The substratum extends to a depth of more than 40 inches. Depth to bedrock ranges to more than 10 feet.

Buncombe soils occur with the Congaree soils but are coarser textured than those soils.

Buncombe soils (0 to 2 percent slopes) (Bu).—These are the only Buncombe soils mapped in Wake County. They have a surface layer of dark grayish-brown to pale-

brown sand or loamy sand 4 to 10 inches thick. Beneath the surface layer are layers of pale-brown to yellowish-brown sand or loamy sand that range from 30 to more than 36 inches in total thickness.

Droughtiness is a hazard during dry spells, and these soils are subject to leaching during wet spells. Infiltration is good, and surface runoff is slow. The soils are easy to keep in good tilth and can be worked throughout a wide range of moisture content.

These soils are fairly well suited to corn, truck crops, small grains, and pasture. Most of the acreage is in forest, but a small acreage is in pasture. (Capability unit IVs–1, woodland suitability group 3, wildlife suitability group 4)

Cecil Series

The Cecil series consists of gently sloping to steep, well-drained, deep soils of the Piedmont uplands. These soils are on side slopes and on rounded divides that have a difference in elevation of about 75 feet between the highest and the lowest points. They occupy large areas in the northern and central parts of the county, where they have formed under forest in material that weathered from gneiss, schist, and other acidic rocks. The water table remains below the solum.

Natural fertility and the content of organic matter are low, and permeability is moderate. The available water capacity is medium, and the shrink-swell potential is moderate. Except in areas that have received lime, these soils are medium acid to strongly acid. Response is good if suitable applications of lime and fertilizer are made.

Cecil soils are fairly important for farming. Nevertheless, much of the acreage is in forest.

Representative profile of a Cecil sandy loam in a cultivated field one-half mile northwest of Barton Creek where N.C. Highway No. 50 crosses that stream.:

Ap—0 to 6 inches, dark-brown (7.5YR 4/4) sandy loam; weak, fine and medium, granular structure; very friable when moist; many fine, fibrous roots; many fine pores; common small quartz pebbles; strongly acid; abrupt, wavy boundary.

B21t—6 to 11 inches, red (2.5YR 5/8) clay; strong, fine and medium, subangular blocky structure; firm when moist, sticky and plastic when wet; common, fine, fibrous roots; many fine pores; medium clay films on the surfaces of most peds; medium acid; clear, smooth boundary.

B22t—11 to 24 inches, red (2.5YR 4/8) clay; strong, fine and medium, subangular blocky structure; firm when moist, sticky and plastic when wet; few, fine, fibrous roots; many fine pores; medium clay films on the surfaces of most peds; few fine mica flakes; strongly acid; clear, wavy boundary.

B23t—24 to 34 inches, red (2.5YR 4/6) clay; few, fine, prominent, reddish-yellow mottles; strong, fine and medium, subangular blocky structure; firm when moist, sticky and plastic when wet; few, fine, fibrous roots; many fine pores; medium clay films on the surfaces of most peds; few fine mica flakes; medium acid; clear, wavy boundary.

B3—34 to 59 inches, red (2.5YR 4/8) clay loam; common, fine, prominent, reddish-yellow mottles; weak, medium and coarse, subangular blocky structure; friable when moist, slightly sticky and slightly plastic when wet; medium clay films on the vertical surfaces of peds; common fine mica flakes; strongly acid; abrupt, smooth boundary.

C—59 to 72 inches +, red (2.5YR 4/6) loam (disintegrated schist); common, fine, prominent, reddish-yellow and few, fine, distinct, dark-red mottles; massive; very friable when moist, nonsticky and nonplastic when wet; strongly acid.

The A horizon ranges from dark grayish brown or yellowish brown to dark brown or red in color, from sandy loam or gravelly sandy loam to clay loam in texture, and from 3 to 12 inches in thickness. The B2 horizons range from 28 to 50 inches in total thickness. They have a red color of 2.5YR hue and a clay texture. In places these soils contain a yellowish-red B1 horizon, and the B3 horizon is streaked with yellow in some areas. The combined thickness of the surface layer and the subsoil is 36 to 60 inches. Depth to hard rock ranges from 5 to more than 15 feet.

Cecil soils occur with Appling, Lloyd, Madison, and Georgeville soils. They have a more reddish color and a more clayey subsoil than the Appling soils. Cecil soils have a lighter colored surface layer, a lighter red color beneath the surface layer, and more sand in the subsoil than the Lloyd soils. They are thicker and less micaceous than the Madison soils and have less silt and more sand throughout the profile than the Georgeville soils.

Cecil sandy loam, 2 to 6 percent slopes (CeB).—This soil is on broad, smooth interstream divides. Its surface layer is dark grayish-brown to yellowish-brown sandy loam 7 to 12 inches thick. The subsoil is red, firm clay 30 to 50 inches thick.

Included in mapping were some areas of a soil that has a surface layer of fine sandy loam. Also included were a few areas where the slopes are less than 2 percent.

Infiltration is good, and surface runoff is medium. The hazard of erosion is moderate. This soil is easy to keep in good tilth and can be worked throughout a wide range of moisture content.

About one-half of the acreage is cultivated or in pasture, and the rest is in forest or in other uses. Where this soil has been cleared, it is used chiefly for row crops and pasture, but it is well suited to all the locally grown crops. Practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIe–1, woodland suitability group 5, wildlife suitability group 1)

Cecil sandy loam, 2 to 6 percent slopes, eroded (CeB2).—This soil is on broad, smooth interstream divides in the uplands. Its surface layer is 3 to 7 inches thick. In many places it is a mixture of the remaining original surface layer and of material from the subsoil. In the less eroded areas, the surface layer is yellowish-brown sandy loam, but the color ranges to reddish brown and the texture ranges to clay loam in the more eroded spots. The subsoil is red, firm clay that is 30 to 50 inches thick.

Included with this soil in mapping were some areas where the surface layer is fine sandy loam. Also included were some severely eroded spots where the subsoil is exposed. The severely eroded spots make up from 5 to 25 percent of the acreage in the mapping unit.

Infiltration is fair, and surface runoff is medium. The hazard of further erosion is moderate. This soil is difficult to keep in good tilth, but it can be worked throughout a fairly wide range of moisture content. A crust forms on the severely eroded spots after hard rains, and clods form if those areas are worked when wet. The crust and the clods interfere with germination. As a result, stands of crops are poor and replanting of the severely eroded areas may be necessary.

About half of the acreage is cultivated or in pasture, and the rest is in forest or in other uses. Where this soil is cultivated, it is used chiefly for row crops, but it is well suited to all the locally grown crops. Practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIe–1, woodland suitability group 5, wildlife suitability group 1)

Cecil sandy loam, 6 to 10 percent slopes (CeC).—This soil is on short to long side slopes in the uplands. Its surface layer is 7 to 12 inches thick, and it is dark grayish-brown to yellowish-brown sandy loam. The subsoil is red, firm clay 30 to 45 inches thick. Included with this soil in mapping were some areas where the surface layer is fine sandy loam.

Infiltration is good, and surface runoff is rapid. The hazard of erosion is severe. This soil is easy to keep in good tilth and can be worked throughout a wide range of moisture content.

About one-fourth of the acreage is cultivated or in pasture, and the rest is in forest or in other uses. The cultivated areas are used chiefly for row crops, but this soil is well suited to all the locally grown crops. Practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIIe–1, woodland suitability group 5, wildlife suitability group 1)

Cecil sandy loam, 6 to 10 percent slopes, eroded (CeC2).—This soil is on short to long side slopes in the uplands. The surface layer is 3 to 7 inches thick and in many places it is a mixture of the remaining original surface soil and of material from the subsoil. In the less eroded areas, the surface layer is yellowish-brown sandy loam. In the more eroded spots, the color ranges to reddish brown and the texture ranges to clay loam. The subsoil is red, firm clay 30 to 45 inches thick.

Included in mapping were some areas where the surface layer is fine sandy loam. Also included were some severely eroded spots where the subsoil is exposed. The severely eroded areas make up from 5 to 25 percent of the acreage in the mapping unit.

Infiltration is fair, and surface runoff is rapid. The hazard of further erosion is severe. This soil is difficult to keep in good tilth, but it can be worked throughout a fairly wide range of moisture content. A crust forms on the severely eroded spots after hard rains, and clods form if those areas are worked when wet. The crust and the clods interfere with germination. As a result, stands of crops are poor and replanting of the severely eroded areas may be necessary.

About one-fourth of the acreage is cultivated or in pasture, and the rest is in forest or in other uses. This soil is well suited to all the locally grown crops. The areas that are cleared are used chiefly for row crops and pasture. Practices that effectively control runoff and erosion are needed. (Capability unit IIIe–1, woodland suitability group 5, wildlife suitability group 1)

Cecil sandy loam, 10 to 15 percent slopes (CeD).—This is a well-drained, slightly to moderately eroded soil on narrow side slopes bordering upland drainageways. Where erosion is only slight, the surface layer is dark grayish-brown to yellowish-brown sandy loam 6 to 10 inches thick. Where erosion is moderate, the surface layer is yellowish-brown to reddish-brown sandy loam to clay loam 3 to 6 inches thick. The subsoil is red, firm clay that is 30 to 40 inches thick.

Included with this soil in mapping were areas where the texture of the surface layer is fine sandy loam. Also included were many areas where pebbles and cobbles are on the surface and in the surface layer, and some severely eroded spots where the subsoil is exposed.

Infiltration is fair to good, and surface runoff is very rapid. The hazard of erosion is very severe. Where this soil is only slightly eroded, it is easy to keep in good tilth. Where it is moderately eroded, it is difficult to keep in good tilth. This soil can be worked throughout a fairly wide range of moisture content. A crust forms on the severely eroded spots after hard rains, however, and clods form if those areas are worked when wet. The crust and the clods interfere with germination. As a result, stands of crops are poor and replanting of a severely eroded spot is sometimes necessary.

About one-fourth of the acreage is cultivated or in pasture, and the rest is in forest. This soil is suited to all the locally grown crops, but practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IVe–1, woodland suitability group 5, wildlife suitability group 1)

Cecil sandy loam, 15 to 45 percent slopes (CeF).—This is a slightly to moderately eroded soil on narrow side slopes bordering upland drainageways. Where erosion is only slight, the surface layer is dark grayish-brown to yellowish-brown sandy loam 5 to 9 inches thick. Where erosion is moderate, the surface layer is only 3 to 6 inches thick, its color ranges from yellowish brown to reddish brown, and its texture ranges to clay loam. The subsoil is red, firm clay 30 to 36 inches thick.

Included with this soil in mapping were some areas where the subsoil is only 18 to 30 inches thick, and other areas where the surface layer is fine sandy loam. Also included were many areas where pebbles and cobblestones are in the surface layer and on the surface; a few severely eroded spots where the subsoil is exposed; and some areas of Georgeville silt loams and of Lloyd loams.

Infiltration is fair to good, and surface runoff is very rapid. This soil is highly susceptible to erosion.

Practically all of the acreage is in forest. This soil is not suited to crops that require cultivation. Areas that have been cleared can be used for permanent hay and pasture. (Capability unit VIe–1, woodland suitability group 5, wildlife suitability group 1)

Cecil gravelly sandy loam, 2 to 6 percent slopes (CgB).—This soil is on broad, smooth interstream divides in the uplands. It has a surface layer that is 7 to 12 inches thick and consists of dark grayish-brown gravelly sandy loam that is 15 to 30 percent pebbles. The subsoil is red, firm clay 30 to 50 inches thick. In many places cobblestones are in the surface layer and on the surface.

Infiltration is good, and surface runoff is moderate. The hazard of erosion is moderate. This soil can be worked throughout a wide range of moisture content. Where the content of pebbles and cobblestones is high, however, tillage is difficult.

About half of the acreage is cultivated or in pasture, and the rest is in forest or in other uses. Where this soil has been cleared, it is used chiefly for row crops and pas-

ture, but it is well suited to all the locally grown crops. Practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIe–1, woodland suitability group 5, wildlife suitability group 1)

Cecil gravelly sandy loam, 2 to 6 percent slopes, eroded (CgB2).—This soil is on broad interstream divides in the uplands. In many places its surface layer is a mixture of the remaining original surface soil and of material from the subsoil. In the less eroded spots, the surface layer is yellowish-brown gravelly sandy loam. In the more eroded spots, the color ranges to reddish brown and the texture ranges to gravelly clay loam. Thickness of the surface layer ranges from 3 to 7 inches, and the content of gravel in the surface layer ranges from 15 to 30 percent.

Included with this soil in mapping were some areas that contain cobblestones. Also included were some severely eroded spots where the subsoil is exposed. These severely eroded spots make up from 5 to 25 percent of the acreage in the mapping unit.

Infiltration is fair, and surface runoff is medium. The hazard of further erosion is moderate. This soil is difficult to keep in good tilth, but it can be worked throughout a fairly wide range of moisture content. A crust forms on the severely eroded spots after hard rains, and clods form if those areas are worked when wet. The crust and the clods interfere with germination. As a result, stands of crops are poor and replanting of the severely eroded spots may be necessary.

About half of the acreage is cultivated or in pasture, and the rest is in forest or in other uses. Where this soil has been cleared, it is used chiefly for row crops and pasture, but it is well suited to all the locally grown crops. Practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIe–1, woodland suitability group 5, wildlife suitability group 1)

Cecil gravelly sandy loam, 6 to 10 percent slopes (CgC).—This soil is on short to long side slopes in the uplands. It has a surface layer that is 7 to 12 inches thick that consists of dark grayish-brown sandy loam that is 15 to 30 percent pebbles. The subsoil is red, firm clay 30 to 45 inches thick. In many places cobblestones are in the surface layer and on the surface.

Infiltration is good, and surface runoff is rapid. The hazard of erosion is severe. This soil can be worked throughout a wide range of moisture content. Where the content of pebbles and cobblestones is high, however, tillage is difficult.

About one-fourth of the acreage is cultivated or in pasture, and the rest is in forest or in other uses. Where this soil has been cleared, it is used chiefly for row crops and pasture, but it is well suited to all the locally grown crops. Practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIIe–1, woodland suitability group 5, wildlife suitability group 1)

Cecil gravelly sandy loam, 6 to 10 percent slopes, eroded (CgC2).—This soil is on short to long side slopes in the uplands. Its surface layer is 3 to 7 inches thick, and in many places it is a mixture of the remaining original surface soil and of material from the subsoil. In the less eroded areas, the surface layer is yellowish-brown gravelly sandy loam, but the color ranges to reddish brown and the texture ranges to gravelly clay loam in the more eroded spots. The content of gravel in the surface layer ranges from 15 to 30 percent. The subsoil is red, firm clay 30 to 45 inches thick. In many places cobblestones are in the surface layer and on the surface.

Included with this soil in mapping were some severely eroded spots where the subsoil is exposed. These areas make up from 5 to 25 percent of the acreage in the mapping unit.

Infiltration is fair, and surface runoff is rapid. The hazard of further erosion is severe. This soil is difficult to keep in good tilth, but it can be worked throughout a fairly wide range of moisture content. A crust forms on the severely eroded spots after hard rains, and clods form if those areas are worked when wet. The crust and the clods interfere with germination. As a result, stands of crops are poor and replanting of the severely eroded spots is sometimes necessary.

About one-fourth of the acreage is cultivated or in pasture, and the rest is in forest or in other uses. This soil is well suited to all the locally grown crops, but the cultivated areas are used chiefly for row crops. Intensive practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIIe–1, woodland suitability group 5, wildlife suitability group 1)

Cecil clay loam, 2 to 6 percent slopes, severely eroded (ClB3).—This soil is on smooth interstream divides. The surface layer is red clay loam 3 to 6 inches thick. Mostly, it consists of material from the subsoil, but it contains some material from the original surface layer. The subsoil is red, firm clay 30 to 50 inches thick. Included with this soil in mapping were small areas of soils that have a subsoil of dark-red clay.

Infiltration is poor, and surface runoff is rapid. The hazard of further erosion is severe. This soil is difficult to keep in good tilth, and it can be worked within only a narrow range of moisture content. A crust forms after hard rains, and clods form if this soil is worked when wet. The crust and the clods interfere with germination. As a result, stands of crops are poor.

This soil is suited to only a limited number of crops grown locally. Only a small acreage is cultivated or in pasture, and most of the acreage is in forest. Where cultivated crops are grown, intensive practices that effectively control runoff and erosion are necessary. (Capability unit IIIe–2, woodland suitability group 5, wildlife suitability group 1)

Cecil clay loam, 6 to 10 percent slopes, severely eroded (ClC3).—This soil is on narrow side slopes in the uplands. Its surface layer is red clay loam 3 to 6 inches thick. The surface layer consists mostly of material from the subsoil, but it contains some material from the original surface layer. The subsoil is red, firm clay 30 to 45 inches thick. Included with this soil in mapping were small areas of soils that have a subsoil of dark-red clay.

Infiltration is poor. Surface runoff is very rapid, and the hazard of further erosion is very severe. This soil is difficult to keep in good tilth, and it can be worked

within only a narrow range of moisture content. A crust forms after hard rains, and clods form if this soil is worked when wet. The crust and the clods interfere with germination. As a result, a good stand of crops is hard to obtain.

This soil is suited to only a limited number of crops grown locally. It is mostly in forest, and only a small acreage is cultivated or in pasture. If cultivated crops are grown, intensive practices that effectively control runoff and erosion are necessary. (Capability unit IVe–2, woodland suitability group 5, wildlife suitability group 1)

Cecil clay loam, 10 to 20 percent slopes, severely eroded (CIE3).—This soil is on narrow side slopes bordering upland drainageways. The surface layer is red clay loam 3 to 6 inches thick. Mostly, it consists of material from the subsoil, but it contains some material from the original surface layer. The subsoil is red, firm clay 30 to 40 inches thick.

Included with this soil in mapping were small areas of a soil that has a subsoil of dark-red clay. Also included were a few areas where the slopes are greater than 20 percent.

Infiltration is poor, and surface runoff is very rapid. This soil is difficult to keep in good tilth, and it can be worked within only a narrow range of moisture content. A crust forms after hard rains, and clods form if this soil is worked when wet. Because of the crust and the clods, a good stand of pasture and hay crops is difficult to obtain.

This soil is suited to permanent hay, pasture, and forest, but it is chiefly in forest. It is too steep and eroded for cultivated crops. (Capability unit VIe–2, woodland suitability group 5, wildlife suitability group 1)

Chewacla Series

The Chewacla series consists of nearly level, somewhat poorly drained soils on the flood plains of most of the streams in the county. These soils have formed in alluvial deposits of fine loamy material. A seasonally high water table is at a depth of about 1½ feet.

Figure 3.—**Young corn on Chewacla soils that have been flooded by the waters of Crabtree Creek.**

Natural fertility and the content of organic matter are low, permeability is moderate to moderately rapid, and the available water capacity is medium. The shrink-swell potential is moderate to low. These soils are frequently flooded (fig. 3), but the floodwaters remain for only a brief period of time. Except in areas that have received lime, the soils are strongly acid. Response is good if suitable applications of lime and fertilizer are made.

The Chewacla soils in Wake County are not important for farming. Most of the acreage is in forest, and only a small acreage is cultivated or in pasture.

Representative profile of a Chewacla fine sandy loam in a cultivated field 100 yards north of Horse Creek and one-fourth of a mile east of N.C. Highway No. 98:

Ap—0 to 6 inches, brown (10YR 5/3) fine sandy loam; weak, fine, granular structure; very friable when moist; many to common, fine, fibrous roots; fine pores; common fine mica flakes; slightly acid; abrupt, wavy boundary.

A1—6 to 10 inches, dark yellowish-brown (10YR 4/4) fine sandy loam; weak, fine, granular structure; very friable when moist; few, fine, fibrous roots; common fine pores; many small mica flakes; slightly acid; abrupt, wavy boundary.

B21—10 to 18 inches, dark yellowish-brown (10YR 4/4) silt loam; many, medium, prominent, reddish-yellow and common, medium, distinct, pale-brown mottles; weak, fine, subangular blocky structure; very friable when moist, nonsticky and nonplastic when wet; few, fine, fibrous roots; common fine pores; many fine mica flakes; slightly acid; abrupt, wavy boundary.

B22—18 to 38 inches, pale-brown (10YR 6/3) sandy loam; common, medium, prominent, brown mottles and common, medium, distinct, grayish-brown mottles; weak, medium, subangular blocky structure; very friable when moist, nonsticky and nonplastic when wet; few fine pores; common black concretions and few fine mica flakes; slightly acid; abrupt, smooth boundary.

C1g—38 to 42 inches, light brownish-gray (2.5Y 6/2) fine sandy loam; common, medium, prominent, dark yellowish-brown mottles; structureless; very friable when moist, nonsticky and nonplastic when wet; few fine pores; few fine mica flakes; very slightly acid; abrupt, smooth boundary.

C2g—42 to 48 inches +, gray (10YR 5/1) fine sandy loam; few, medium, prominent, dark-brown mottles and few, fine, distinct, yellowish-brown mottles; structureless; very friable when moist, nonsticky and nonplastic when wet; few, fine, fibrous roots; common fine pores; very slightly acid.

The A horizons range from 4 to 12 inches in combined thickness, from brown to dark grayish brown or dark yellowish brown in color, and from sandy loam to silt loam in texture. The B horizons range from 10 to more than 40 inches in total thickness and from sandy loam or silt loam to clay loam in texture. Their color ranges from light yellowish brown or pale brown to dark grayish brown in 7.5YR, 10YR, and 2.5Y hues. Mottles are at depths below 10 to 30 inches. The subsoil and substratum are massive or have weak, medium, subangular blocky structure. The profile ranges from 34 inches to more than 72 inches in thickness. Depth to hard rock ranges from 4 to more than 15 feet.

Chewacla soils occur with Congaree and Wehadkee soils. They are less well drained than the Congaree soils and are better drained than the Wehadkee.

Chewacla soils (0 to 2 percent slopes) (Cm).—The soils of this mapping unit are on the flood plains of streams. Their surface layer is brown to dark grayish-brown sandy loam to silt loam 4 to 12 inches thick. Beneath the surface layer, the color of the soil material ranges from

brown to dark grayish brown, with mottles of brown and gray, and the texture ranges from sandy loam or silt loam to clay. The total thickness of the profile ranges from 34 inches to more than 72 inches.

Infiltration is good, and surface runoff is slow. The hazard of flooding is severe, and the hazard of wetness is very severe. These soils are easy to keep in good tilth and can be worked throughout a wide range of moisture content.

Most of the acreage is in forest, but a small acreage is in pasture or is cultivated. These soils are fairly well suited to many of the locally grown crops, but subsurface drainage is needed for crops that require good drainage. (Capability unit IIIw–1, woodland suitability group 1, wildlife suitability group 2)

Colfax Series

Soils of the Colfax series, as mapped in the county, lack a fragipan, and in the future will be assigned to some other series. The series consists of nearly level and gently sloping, somewhat poorly drained soils on Piedmont uplands. These soils are at the heads of drainageways, on foot slopes, and in slight depressions. They have formed under forest, in translocated material, and in material that weathered from most kinds of rocks in the county. A seasonally high water table is at a depth of about 1½ feet.

Natural fertility and the content of organic matter are low. Permeability is moderately slow, and the available water capacity is medium. The shrink-swell potential is moderate. Except in areas that have received lime, these soils are strongly acid. Response is fairly good if suitable applications of lime and fertilizer are made.

The Colfax soils in this county are mostly in forest and are not important for farming. Where they have been cleared, they are generally used for pasture or for waterways. The areas are mostly too small for managing as a field independent of the surrounding soils.

Representative profile of Colfax sandy loam in a pasture one-half mile southwest of Wakefield on county road No. 2368 and 35 yards north of the road:

Ap—0 to 7 inches, very dark grayish-brown (10YR 3/2) sandy loam; many, fine, distinct, dark-brown mottles; weak, fine, granular structure; very friable when moist; many fine, fibrous roots; many fine pores; strongly acid; abrupt, smooth boundary.

A1—7 to 11 inches, dark grayish-brown (10YR 4/2) sandy loam; weak, fine, granular structure; very friable when moist; few, fine, fibrous roots; many fine pores; strongly acid; abrupt, wavy boundary.

A2—11 to 19 inches, grayish-brown (10YR 5/2) loamy sand; weak, fine, granular structure; very friable when moist; brittle in place; many fine pores; strongly acid; abrupt, wavy boundary.

B2t—19 to 31 inches, strong-brown (7.5YR 5/8) sandy clay loam; many, medium, prominent, gray mottles; moderate, coarse, subangular blocky structure; firm when moist, sticky and plastic when wet; few fine pores; thick clay films on most ped surfaces; strongly acid; clear, smooth boundary.

B3tg—31 to 36 inches, gray (10YR 6/1) sandy clay loam; common, fine, prominent, yellowish-brown mottles; weak, medium, subangular blocky structure; firm when moist, slightly sticky and slightly plastic when wet; few fine pores; few thin clay films on ped surfaces; strongly acid; gradual, smooth boundary.

Cg—36 to 45 inches +, gray (10YR 5/1) sandy loam; few, fine, prominent, yellowish-brown mottles; massive; firm when moist, slightly sticky and slightly plastic when wet; many fine pores; strongly acid.

The combined thickness of the A horizons ranges from 5 to 20 inches, and the color of those horizons ranges from light gray to very dark grayish brown. The B horizons range from 15 to 50 inches in combined thickness, and they have a texture of clay or clay loam instead of sandy clay loam in some places. The color of the B horizons ranges from light olive yellow to strong brown or gray in hues of 2.5Y, 10YR, and 7.5YR. Mottles that have the gray color of a gleyed soil are in the uppermost 10 inches of the B2t horizon. In places these soils contain a brownish-yellow B1 horizon. The combined thickness of the surface layer and subsoil ranges from 24 inches to 60 inches. Depth to hard rock ranges from 5 to more than 15 feet.

The Colfax soils occur with Helena and Worsham soils. They are less well drained, have less clay in their subsoil, and are less firm than the Helena soils. The Colfax soils are better drained than the Worsham soils.

Colfax sandy loam (0 to 6 percent slopes) (Cn).—This is the only soil of the Colfax series mapped in Wake County. It occurs at the heads of drainageways, on foot slopes, and in slight depressions. The surface layer is light-gray to very dark grayish-brown sandy loam 5 to 20 inches thick. The subsoil is 15 to 50 inches thick and is light olive-yellow to strong-brown or gray, firm sandy clay loam or clay loam that is commonly mottled with brown, yellow, and gray. Included with this soil in mapping were a few areas of a soil that has a surface layer of silt loam.

Infiltration is good, and surface runoff is medium to slow. This soil is easy to keep in good tilth, and it can be worked throughout a wide range of moisture content.

Most of the acreage is in forest, but this soil is suited to many of the locally grown crops. The areas that have been cleared are used chiefly for pasture or waterways. (Capability unit IIIw–2, woodland suitability group 4, wildlife suitability group 2)

Congaree Series

The Congaree series consists of nearly level, well-drained soils on the flood plains of most of the streams in the county. These soils have formed in deposits of fine loamy material. A seasonally high water table is at a depth of about 2½ feet.

Natural fertility and the content of organic matter are low, and permeability is moderate to moderately rapid. The available water capacity is medium, and the shrink-swell potential is moderate to low. These soils are flooded frequently for a brief period of time. Except in areas that have received lime, they are strongly acid.

The Congaree soils of Wake County are fairly important for farming. Most of the acreage is cultivated or in pasture, but a small acreage is in forest.

Representative profile of Congaree fine sandy loam on Sycamore Creek, 1½ miles south of Ebenezer Church in a wooded area one-fourth mile west of road:

Ap—0 to 8 inches, strong-brown (7.5YR 5/8) fine sandy loam; weak, fine, granular structure; very friable when moist; many fine, woody roots; medium acid; abrupt, smooth boundary.

B21—8 to 20 inches, dark-brown (7.5YR 4/4) heavy fine sandy loam; massive to weak, medium, subangular blocky structure; very friable when moist; common, fine, woody roots; strongly acid; abrupt, smooth boundary.

B22—20 to 32 inches, strong-brown (7.5YR 5/6) fine sandy loam; massive to weak, medium, subangular blocky structure; very friable when moist; few, fine and medium, woody roots; common, fine mica flakes; strongly acid; abrupt, smooth boundary.

C—32 to 42 inches +, yellowish-brown (10YR 5/6) loamy sand; single grain; loose when moist or dry; common, fine mica flakes; few small pebbles; strongly acid.

The A horizon ranges from 4 to 12 inches in thickness, from dark brown or brown to strong brown in color, and from fine sandy loam to silt loam in texture. The B horizons range from 10 to 30 inches in combined thickness, from fine sandy loam or silt loam to silty clay loam in texture, and from dark brown or strong brown to pale brown, brownish yellow, or dark grayish brown in color. In places gray mottles are below a depth of 30 inches. The C horizon ranges from yellowish brown to dark brown or gray in color and from loamy sand to silty clay loam in texture. It extends to a depth of 30 to more than 120 inches. Depth to bedrock ranges from 5 to more than 15 feet.

Congaree soils occur with Chewacla and Buncombe soils. They are better drained than the Chewacla soils and are finer textured throughout than the Buncombe soils.

Congaree silt loam (0 to 2 percent slopes) (Cp).—This soil is on the flood plains of streams. It has a brown or dark-brown surface layer that is 4 to 12 inches thick. Beneath the surface layer, the soil material is silt loam that ranges from brown to dark brown in color and from 30 to 108 inches in total thickness.

Infiltration is good and surface runoff is slow. The hazard of overflow is severe. This soil is easy to keep in good tilth, and it can be worked throughout a wide range of moisture content.

Most of the acreage is cultivated or in pasture, but a small acreage is in forest. Where this soil has been cleared, it is used mainly for row crops and pasture. It is suited to many of the locally grown crops. (Capability unit IIw–2, woodland suitability group 1, wildlife suitability group 2)

Congaree fine sandy loam (0 to 2 percent slopes) (Co).—This soil is on the flood plains of streams. Its surface layer is dark-brown to strong-brown fine sandy loam 4 to 12 inches thick. Beneath the surface layer, the soil material ranges from pale brown or brownish yellow to dark brown or dark grayish brown in color, from fine sandy loam to silty clay loam in texture, and from 10 to 108 inches in total thickness.

Infiltration is good, and surface runoff is slow. The hazard of overflow is severe. This soil is easy to keep in good tilth, and it can be worked throughout a wide range of moisture content.

This soil is well suited to many of the locally grown crops. Most of the acreage is cultivated or in pasture. (Capability unit IIw–2, woodland suitability group 1, wildlife suitability group 2)

Creedmoor Series

The Creedmoor series consists of gently sloping to moderately steep, moderately well drained soils of Piedmont uplands in the western part of the county. These soils are on rounded divides where the difference in elevation is about 50 feet between the highest and the lowest points. They have formed under forest in material that weathered from sandstone, mudstone, and shale of Triassic age (fig. 4). The water table usually remains below the solum. Because of the slow permeability of the subsoil, however, there is a perched water table during wet seasons.

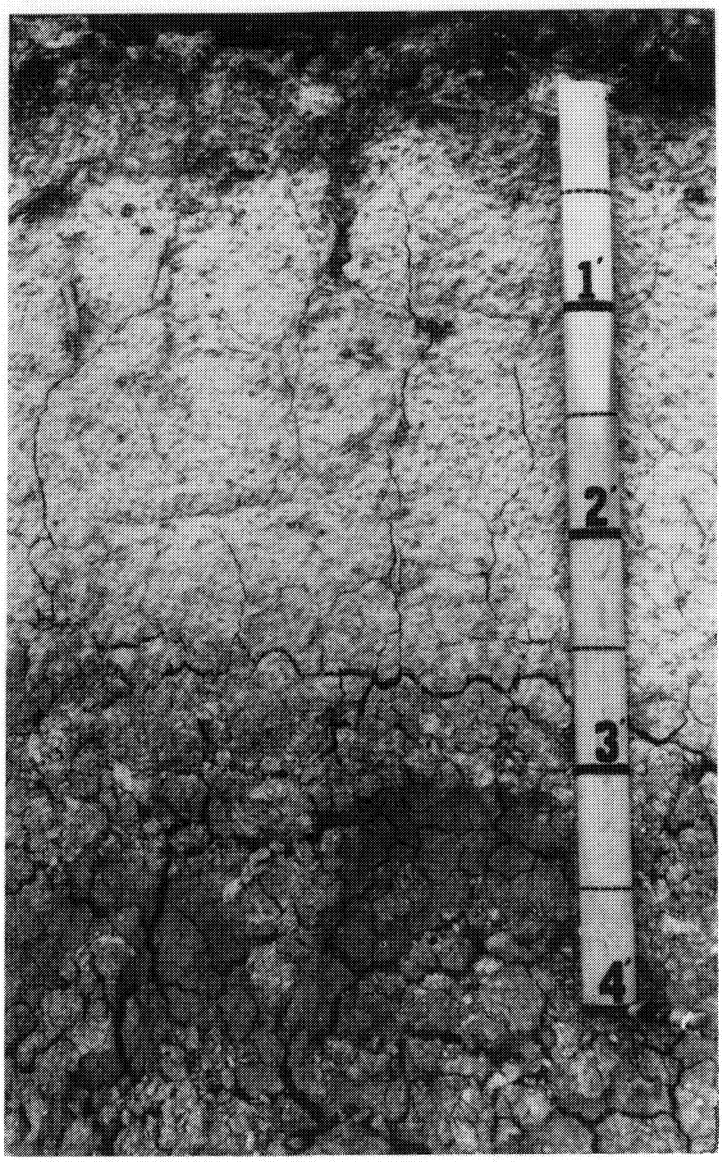

Figure 4.—**Profile of a Creedmoor silt loam. In these soils the lower part of the subsoil consists of clay that is very firm when moist, is very plastic when wet, and has high shrink-swell potential.**

Natural fertility and the content of organic matter are low, and permeability is slow. The available water capacity is medium to high, and the shrink-swell potential is high. Except in areas that have received lime, these soils are very strongly acid. Response is good if suitable applications of lime and fertilizer are made.

Much of the acreage is in forest, but a large acreage is cultivated or in pasture. The areas that are cultivated

are used intensively for growing tobacco and other row crops.

Representative profile of a Creedmoor sandy loam in a stand of young pines one-fourth mile west of Airport Road, one-third mile south of U.S. Highway No. 70, and 5 yards north of farm road:

Ap—0 to 6 inches, grayish-brown (2.5Y 5/2) sandy loam; weak, medium, granular structure; very friable when moist; many fine, woody and fibrous roots; few quartz pebbles; strongly acid; abrupt, wavy boundary.

A2—6 to 12 inches, pale-yellow (2.5Y 7/4) sandy loam; weak, medium, granular structure; very friable when moist; common, fine, woody and fibrous roots; few small quartz pebbles; very strongly acid; abrupt, wavy boundary

B1—12 to 18 inches, pale-yellow (2.5Y 7/4) heavy sandy clay loam; common, medium, distinct, brownish-yellow mottles; moderate, fine and medium, subangular blocky structure; friable when moist, sticky and plastic when wet; few, fine, woody and fibrous roots; few small quartz pebbles; very strongly acid; clear, wavy boundary.

B21t—18 to 29 inches, yellow (10YR 7/8) clay loam; few, fine, prominent, red mottles and common, medium, distinct, strong-brown mottles; strong, fine and medium, angular blocky structure; friable to firm when moist, sticky and plastic when wet; few, fine, fibrous roots; thin clay films; few quartz pebbles; red mottles are disintegrated nodules; very strongly acid; clear, wavy boundary.

B22t—29 to 40 inches, reddish-yellow (7.5YR 6/8) clay; many, coarse, prominent, light-gray (5YR 7/1) mottles and few to common, fine, prominent, red mottles; strong, fine and medium, angular blocky structure; very firm when moist, sticky and very plastic when wet; several disintegrated roots in old root channels; red mottles are disintegrated nodules; thin clay films; very strongly acid; clear, wavy boundary.

B3t—40 to 58 inches, light-gray (5Y 7/2) clay; many, coarse, prominent, reddish-yellow (7.5YR 6/8) mottles and a few, fine, prominent, red mottles; weak, coarse, angular blocky structure tending to massive; very firm when moist, sticky and plastic when wet; common disintegrated roots in old root channels; red mottles are disintegrated nodules; few thin clay films; very strongly acid; clear, wavy boundary.

C—58 to 96 inches, pale-red, disintegrated shale that generally has a texture of clay to sandy clay but contains pockets of gray clay; very strongly acid; abrupt, smooth boundary.

R—96 to 100 inches +, dusky-red, stratified, weakly cemented sandstone of Triassic age.

In general, the A horizons range from 3 to 15 inches in total thickness, from gray or grayish brown to pale yellow in color, and from sandy loam to silt loam in texture. In eroded areas, however, the color ranges to strong brown and the texture ranges to clay loam. The B1 horizon ranges from 6 to 10 inches in thickness and from friable silty clay loam to sandy clay loam in texture. It has weak or moderate, fine and medium, subangular blocky structure. The B2t horizons range from 14 to 50 inches in total thickness, from yellow to reddish brown or reddish yellow in color, and from friable to firm clay loam to very firm clay in texture and consistence. In those horizons the color of the mottles ranges from red or strong brown to light gray. Creedmoor soils have a high content of exchangeable aluminum.

Creedmoor soils occur with Helena, Colfax, Mayodan, and White Store soils. They contain more exchangeable aluminum than the Helena soils, are better drained and have a firmer and more plastic lower subsoil than the Colfax soils, and are less well drained and have a firmer and more plastic lower subsoil than the Mayodan soils. The Creedmoor soils have a coarser textured and more friable upper subsoil than the White Store soils.

Creedmoor sandy loam, 2 to 6 percent slopes (CrB).—This soil is on broad, smooth interstream divides in the uplands. It has a surface layer of gray to grayish-brown sandy loam that ranges from 7 to 15 inches in total thickness. The upper part of the subsoil is friable sandy clay loam that is 6 to 10 inches thick. The lower part is 14 to 50 inches thick. It consists of yellow to reddish-brown clay loam that has common mottles of red and light gray and is very firm when moist and very plastic when wet. Included with this soil in mapping were a few areas where the surface layer is coarse sandy loam.

Infiltration is good, but permeability is slow and surface runoff is medium. The hazard of erosion is moderate. This soil is easy to keep in good tilth. After heavy rains, however, tillage may be restricted because of the slow permeability of the subsoil.

About half of the acreage is cultivated or in pasture, and the rest is in forest or in other uses. The cultivated areas are used chiefly for row crops, especially tobacco. This soil is well suited to most of the locally grown crops, but it contains a large amount of exchangeable aluminum, which is toxic to some plants. In the cultivated areas, practices that effectively control runoff and erosion are needed. (Capability unit IIe–3, woodland suitability group 11, wildlife suitability group 1)

Creedmoor sandy loam, 2 to 6 percent slopes, eroded (CrB2).—This soil is on broad, smooth interstream divides in the uplands. Its surface layer is 3 to 7 inches thick. In many places the surface layer is a mixture of the remaining original surface layer and of material from the subsoil. In the less eroded areas, the surface layer is grayish-brown to pale-yellow sandy loam, but in the more eroded spots the color ranges to strong brown and the texture ranges to clay loam. The upper part of the subsoil is friable sandy clay loam that is 6 to 10 inches thick. The lower part is 14 to 50 inches thick. It consists of yellow to reddish-brown clay that has common mottles of red and light gray and is very firm when moist and very plastic when wet.

Included with this soil in mapping were a few places where the texture of the surface layer is coarse sandy loam. Also included were some severely eroded spots where the subsoil is exposed. The severely eroded spots make up from 5 to 25 percent of the acreage in the mapping unit.

Infiltration is fair, and permeability is slow. Surface runoff is medium, and the hazard of further erosion is severe. This soil is difficult to keep in good tilth. Because of the slowly permeable subsoil, tillage is restricted after hard rains. A crust forms on the severely eroded spots after heavy rains, and clods form if those areas are worked when wet. The crust and the clods interfere with germination. As a result, stands of crops are poor and replanting of those areas may be necessary. An even stand of tobacco is hard to obtain. Plants in an uneven stand mature at different times. This increases the difficulty of harvesting and curing the crop and reduces the quality of the tobacco.

About half of the acreage is cultivated or in pasture, and the rest is in forest or in other uses. The cultivated areas are used chiefly for row crops, especially tobacco. This soil is well suited to most of the locally grown

crops, but it contains a large amount of exchangeable aluminum, which is toxic to some plants. Practices that effectively control runoff and erosion are necessary in the cultivated areas. (Capability unit IIIe–3, woodland suitability group 11, wildlife suitability group 1)

Creedmoor sandy loam, 6 to 10 percent slopes (CrC).—This soil is on narrow side slopes in the uplands. It has a surface layer of gray to grayish-brown sandy loam 7 to 15 inches thick. The upper part of the subsoil is friable sandy clay loam 6 to 10 inches thick. The lower part is 14 to 40 inches thick. It consists of yellow to reddish-brown clay that has common mottles of red and light gray and is very firm when moist and very plastic when wet. Included with this soil in mapping were a few areas where the surface layer is coarse sandy loam.

Infiltration is good, but permeability is slow and surface runoff is rapid. The hazard of erosion is severe. This soil is easy to keep in good tilth. After heavy rains, however, tillage may be restricted because of the slow permeability of the subsoil.

About one-third of the acreage is cultivated or in pasture, and the rest is in forest or in other uses. The cultivated areas are used chiefly for row crops, especially tobacco. This soil is well suited to most locally grown crops, but it contains a large amount of exchangeable aluminum, which is toxic to some plants. Because of the slopes and slow permeability, practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIIe–3, woodland suitability group 11, wildlife suitability group 1)

Creedmoor sandy loam, 6 to 10 percent slopes, eroded (CrC2).—This soil is on narrow side slopes in the uplands. The surface layer is 3 to 7 inches thick, and in many places it is a mixture of the remaining original surface soil and of material from the subsoil. In the less eroded areas, the surface layer is grayish-brown to pale-yellow sandy loam, but the color ranges to strong brown and the texture ranges to clay loam in the more eroded spots. The upper part of the subsoil is friable sandy clay loam that is 6 to 10 inches thick. The lower part is 14 to 40 inches thick. It consists of yellow to reddish-brown clay that has common mottles of red and light gray and is very firm when moist and very plastic when wet.

Included with this soil in mapping were a few areas where the surface layer has a texture of coarse sandy loam. Also included were some severely eroded spots where the subsoil is exposed. The severely eroded spots make up from 5 to 25 percent of the acreage in the mapping unit.

Infiltration is fair, but permeability is slow and surface runoff is rapid. The hazard of further erosion is very severe. This soil is difficult to keep in good tilth. Because of the slow permeability of the subsoil, tillage is restricted after heavy rains. A crust forms on the severely eroded spots after hard rains, and clods form if those areas are worked when wet. The crust and the clods interfere with germination. As a result, stands of crops are poor and replanting of the severely eroded areas may be necessary. An even stand of tobacco is hard to obtain. Plants in an uneven stand mature at different times, which increases the difficulty of harvesting and curing the crop and reduces the quality of the tobacco.

About one-third of the acreage is cultivated or in pasture, and the rest is in forest or in other uses. The cultivated areas are used chiefly for row crops. This soil is well suited to most of the locally grown crops, but it contains a large amount of exchangeable aluminum, which is toxic to some plants. Very intensive practices that effectively control runoff and erosion are necessary in the cultivated areas. (Capability unit IVe–3, woodland suitability group 11, wildlife suitability group 1)

Creedmoor sandy loam, 10 to 20 percent slopes (CrE).—This soil is on narrow side slopes bordering upland drainageways. It is slightly eroded in some places and is moderately eroded in others. In the slightly eroded areas, the surface layer is gray to grayish-brown sandy loam 6 to 14 inches thick. In the moderately eroded areas, the surface layer is only 3 to 7 inches thick and consists of grayish-brown or pale-yellow sandy loam to strong-brown clay loam. The upper part of the subsoil is friable sandy clay loam 6 to 10 inches thick. The lower part is 14 to 30 inches thick. It consists of yellow to reddish-brown clay that has common mottles of red and light gray and is very firm when moist and very plastic when wet.

Included with this soil in mapping were a few places where the surface layer is coarse sandy loam, and some areas where the surface layer has a texture of silt loam. Also included were a few severely eroded spots where the subsoil is exposed. The severely eroded spots make up from 5 to 10 percent of the acreage in the mapping unit.

Infiltration is fair to good, and permeability is slow. Surface runoff is very rapid.

Most of the acreage is in forest, but a small acreage is cultivated or in pasture. Where this soil has been cleared, it is better suited to pasture or hay crops than to field crops. It is not suitable for cultivated crops, because of the strong slopes and the slowly permeable subsoil. (Capability unit VIe–1, woodland suitability group 11, wildlife suitability group 1)

Creedmoor silt loam, 2 to 6 percent slopes (CtB).—This soil is on broad, smooth interstream divides in the uplands. Its surface layer is gray to grayish-brown silt loam 7 to 15 inches thick. The upper part of the subsoil is friable silty clay loam 6 to 10 inches thick. The lower part is 14 to 50 inches thick. It consists of yellow to reddish-brown clay that contains common mottles of red and light gray and is very firm when moist and very plastic when wet.

Infiltration is good, but permeability is slow and surface runoff is medium. The hazard of erosion is moderate. This soil is easy to keep in good tilth. Because of the slowly permeable subsoil, however, tillage may be restricted after heavy rains.

Most of the acreage is in forest, but a small acreage is cultivated or in pasture. Where this soil has been cleared, it is used chiefly for row crops and pasture, but it is well suited to most of the locally grown crops. This soil has a high content of exchangeable aluminum, however, which is toxic to some plants. Because of the slopes and the slow permeability, practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIe–3, woodland suitability group 11, wildlife suitability group 1)

Creedmoor silt loam, 6 to 10 percent slopes (CtC).—This soil is on broad, smooth interstream divides in the uplands. Its surface layer is gray to grayish-brown silt loam 7 to 15 inches thick. The upper part of the subsoil is friable silty clay loam 6 to 10 inches thick. The lower part is 14 to 50 inches thick. It consists of yellow to reddish-brown clay that has common mottles of red and light gray and is very firm when moist and very plastic when wet.

Infiltration is good, but permeability is slow and surface runoff is rapid. The hazard of erosion is severe. This soil is easy to keep in good tilth. Because of the slowly permeable subsoil, however, tillage may be restricted after heavy rains.

Most of the acreage is in forest, but a small acreage is cultivated or in pasture. Where this soil has been cleared, it is used chiefly for row crops and pasture. It is well suited to most of the locally grown crops, but it has a high content of exchangeable aluminum, which is toxic to some plants. Because of the slopes and slow permeability, intensive practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIIe-3, woodland suitability group 11, wildlife suitability group 1)

Durham Series

The Durham series consists of gently sloping to sloping, deep, well-drained soils on Piedmont uplands. These soils are mostly in the eastern part of the county, but small areas are scattered in other parts. They are on rounded divides where the difference in elevation is about 20 feet between the highest and the lowest points. The soils have formed under forest in material that weathered from granite, gneiss, and other acidic rocks. The water table remains below the solum.

Natural fertility and the content of organic matter are low, and the available water capacity is medium. Permeability and the shrink-swell potential are moderate. Except where lime has been applied, these soils are strongly acid. Response is good if suitable applications of lime and fertilizer are made.

Durham soils are good for farming. Much of the acreage is cultivated, and the rest is in forest or in other uses.

Representative profile of a Durham loamy sand in a cultivated field one-fourth mile east of the Bethany Church and 5 yards south of road:

Ap—0 to 15 inches, pale-brown (10YR 6/3) loamy sand; weak, coarse, granular structure; very friable when moist; medium acid; abrupt, wavy boundary.

A2—15 to 18 inches, pale-yellow (2.5Y 7/4) loamy sand; weak, coarse, granular structure; very friable when moist; medium acid; abrupt, wavy boundary.

B21t—18 to 30 inches, yellowish-brown (10YR 5/6) sandy clay loam; moderate, fine and medium, subangular blocky structure; friable when moist, slightly sticky and slightly plastic when wet; strongly acid; clear, smooth boundary.

B22t—30 to 42 inches, brownish-yellow (10YR 6/6) clay loam; few, medium, prominent, yellowish-red mottles; moderate, fine and medium, subangular blocky structure; friable when moist, slightly sticky and slightly plastic when wet; strongly acid; gradual, smooth boundary.

B23t—42 to 50 inches, pale-brown (10YR 6/3) sandy clay loam; common, medium, distinct, yellowish-brown and few, medium, prominent, yellowish-red mottles; moderate, fine and medium, subangular blocky structure; friable when moist, slightly sticky and slightly plastic when wet; strongly acid; gradual, smooth boundary.

B24t—50 to 57 inches, pale-brown (10YR 6/3) clay loam; common, medium, distinct, yellowish-brown and few, medium, prominent, yellowish-red mottles; moderate, fine and medium, subangular blocky structure; friable when moist, sticky and slightly plastic when wet; strongly acid; gradual, smooth boundary.

B3t—57 to 60 inches, mottled red (2.5YR 4/8) and strong-brown (7.5YR 5/8) sandy clay loam and gray (10YR 6/1) clay; weak, fine and medium, subangular blocky structure; friable when moist, slightly sticky and slightly plastic when wet; strongly acid; abrupt, smooth boundary.

C—60 to 81 inches +, gray and black sandy loam saprolite that has the same structure as the original rock; strongly acid.

The A horizons range from 3 to 20 inches in total thickness and from brown or pale brown to pale yellow or dark gray in color. The B horizons range from 30 to more than 50 inches in total thickness and from clay to sandy clay loam in texture. Their color ranges from yellow or pale brown to strong brown or gray in hues of 10YR and 7.5YR. The combined thickness of the A horizons and B horizons ranges from 36 to 60 inches. Depth to hard rock ranges from 5 to more than 15 feet.

Durham soils occur with Appling, Vance, Norfolk, and Granville soils. They have a coarser textured subsoil (less than 35 percent clay) than the Appling and Vance soils, and they have a less firm subsoil than the Vance soils. The combined thickness of their surface layer and subsoil is less than that of the Norfolk soils. Durham soils contain less exchangeable aluminum than the Granville soils.

Durham loamy sand, 2 to 6 percent slopes (DuB).—This soil is on broad, smooth interstream divides in the uplands. Its surface layer is pale-brown to dark-gray loamy sand that ranges from 8 to 20 inches in total thickness. The subsoil is yellow to strong-brown, friable sandy clay loam or clay loam that is mottled with yellowish red and is 30 to 50 inches thick.

Included with this soil in mapping were a few areas where the slope is less than 2 percent. Also included were some areas where the surface layer is 18 to 30 inches thick.

Infiltration is good, and surface runoff is medium. The hazard of erosion is moderate. This soil is easy to keep in good tilth and can be worked throughout a wide range of moisture content.

About two-thirds of the acreage is cultivated or in pasture, and the rest is in forest or in other uses. This soil is well suited to all the locally grown crops, especially tobacco and cotton. Practices that effectively control runoff and erosion are needed, however, in the cultivated areas. (Capability unit IIe-1, woodland suitability group 5, wildlife suitability group 1)

Durham loamy sand, 2 to 6 percent slopes, eroded (DuB2).—This soil is on broad, smooth interstream divides in the uplands. Its surface layer is 3 to 7 inches thick. In many places it is a mixture of the remaining original surface layer and of material from the subsoil. In the less eroded areas, the surface layer is brown or pale-brown loamy sand, but the color ranges to strong brown and the texture ranges to sandy clay loam in the more

eroded spots. The subsoil is 30 to 50 inches thick and is yellow to strong-brown, friable sandy clay loam to clay loam that is mottled with yellowish red.

Included with this soil in mapping were some areas where the texture of the surface layer is sandy loam. Also included were some severely eroded spots where the subsoil is exposed. These severely eroded areas make up from 5 to 25 percent of the acreage in the mapping unit.

Infiltration is fair, and surface runoff is medium. The hazard of further erosion is moderate. This soil is difficult to keep in good tilth, but it can be worked throughout a fairly wide range of moisture content. A crust forms on the severely eroded spots after hard rains, and clods form if those areas are worked when wet. The crust and the clods interfere with germination. As a result, stands of crops are poor and replanting of the severely eroded areas is sometimes necessary. An even stand of tobacco is hard to obtain. Plants in an uneven stand mature at different times. This increases the difficulty of harvesting and curing the crop and reduces the quality of the tobacco.

About two-thirds of the acreage is cultivated or in pasture, and the rest is in forest or in other uses. This soil is well suited to all the locally grown crops, and the cultivated areas are used chiefly for row crops, especially tobacco and cotton. Practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIe–1, woodland suitability group 5, wildlife suitability group 1)

Durham loamy sand, 6 to 10 percent slopes (DuC).—This soil is on narrow side slopes in the uplands. Its surface layer is pale-brown to dark-gray loamy sand that ranges from 7 to 15 inches in total thickness. The subsoil is 30 to 40 inches thick and is yellow to strong-brown, friable sandy clay loam to clay loam that is mottled with yellowish red.

Infiltration is good, and surface runoff is rapid. The hazard of erosion is severe. This soil is easy to keep in good tilth and can be worked throughout a wide range of moisture content.

About one-third of the acreage is cultivated or in pasture, and the rest is in forest or in other uses. This soil is well suited to all the locally grown crops, but the cultivated areas are used chiefly for row crops, especially tobacco and cotton. Intensive practices that effectively control runoff and erosion are necessary in the cultivated areas. (Capability unit IIIe–1, woodland suitability group 5, wildlife suitability group 1)

Durham loamy sand, 6 to 10 percent slopes, eroded (DuC2).—This soil is on narrow side slopes in the uplands. Its surface layer is 3 to 7 inches thick. In many places it is a mixture of the remaining original surface soil and of material from the subsoil. In the less eroded areas, the surface layer is brown to pale-brown loamy sand. In the more eroded spots, the color ranges to strong brown and the texture ranges to sandy clay loam. The subsoil is 30 to 40 inches thick and is yellow to strong-brown, friable sandy clay loam that is mottled with yellowish red.

Included with this soil in mapping were some severely eroded spots where the subsoil is exposed. These areas make up from 5 to 25 percent of the acreage in the mapping unit.

Infiltration is fair, and surface runoff is rapid. The hazard of further erosion is severe. This soil is difficult to keep in good tilth, but it can be worked throughout a fairly wide range of moisture content. A crust forms on the severely eroded spots after hard rains, and clods form if those areas are worked when wet. The crust and the clods interfere with germination. As a result, stands of crops are poor and replanting of the severely eroded areas may be necessary. An even stand of tobacco is hard to obtain. Plants in an uneven stand mature at different times. This increases the difficulty of harvesting and curing the crop, and it reduces the quality of the tobacco.

About one-third of the acreage is cultivated or in pasture, and the rest is in forest or in other uses. This soil is well suited to all the locally grown crops, especially tobacco and cotton. Intensive practices that effectively control runoff and erosion are necessary in the cultivated areas. (Capability unit IIIe–1, woodland suitability group 5, wildlife suitability group 1)

Enon Series

The Enon series consists of gently sloping to strongly sloping, deep, well-drained soils on Piedmont uplands. These soils occupy fairly small areas in the northern and western parts of the county. They are on rounded divides that have a difference in elevation of about 50 feet between the highest and the lowest points. The soils have formed under forest in material that weathered from mixed acidic and basic rocks. The water table generally remains below the solum, but there is a perched water table during wet seasons because of the slow permeability of the subsoil.

Natural fertility is medium, and the content of organic matter is low. Permeability is slow, the available water capacity is medium, and the shrink-swell potential is high. Except in areas that have received lime, these soils are slightly acid. Response is good if suitable applications of lime and fertilizer are made.

The Enon soils of this county are of only minor importance for farming. About two-thirds of the acreage is in forest.

Representative profile of an Enon fine sandy loam in a pasture 25 feet east of N.C. Highway No. 50 and 1 mile north of N.C. Highway No. 98:

Ap—0 to 8 inches, dark-brown (7.5YR 4/4) fine sandy loam; weak, fine and medium, granular structure; very friable when moist; many, fine, fibrous roots; many fine pores; few dark-colored concretions; slightly acid; abrupt, wavy boundary.

B21t—8 to 12 inches, strong-brown (7.5YR 5/6) clay; common, fine, distinct, yellowish-brown mottles; moderate, medium and coarse, angular blocky structure; very firm when moist, sticky and plastic when wet; medium clay films; common, fine, fibrous roots; many fine pores; many, soft, black concretions; slightly acid; clear, wavy boundary.

B22t—12 to 26 inches, strong-brown (7.5YR 5/6) clay; common, medium, faint, dark-brown mottles and few, fine, prominent, black mottles; weak, coarse, prismatic structure breaking to weak, medium, angular blocky structure; very firm when moist, sticky and plastic when wet; few, fine, fibrous roots; few fine pores; thick clay films; slightly acid; clear, smooth boundary.

B3t—26 to 32 inches, strong-brown (7.5YR 5/6) clay; many, medium, prominent, red mottles and common, fine, distinct, brownish-yellow mottles; weak, coarse, angular blocky structure; firm when moist, sticky and plastic when wet; few decayed roots in vertical cracks; thick clay films on the vertical surfaces of peds and thin clay films on the horizontal surfaces; few fine pores; slightly acid; abrupt, smooth boundary.

C—32 to 38 inches +, mottled strong-brown (7.5YR 5/6), reddish-yellow (7.5YR 6/8), and red (2.5YR 5/8) clay loam; massive; firm when moist, slightly sticky and slightly plastic when wet; few fine pores; common, soft, black concretions; slightly acid.

The A horizon ranges from 4 to 10 inches in thickness and from brown or dark brown to grayish brown or light gray in color. The B2 horizons range from 10 to 30 inches in total thickness and from clay loam or silty clay loam to clay in texture. Their color ranges from strong brown to reddish yellow, yellowish brown, or olive yellow in 7.5YR, 10YR, and 2.5Y hues, and these horizons are mottled with brown or red in many places. In some areas the weak prismatic primary structure of the B2 horizons breaks to moderate instead of weak, coarse and medium, angular blocky structure. The combined thickness of the A horizon and B horizons ranges from 20 to 40 inches. Depth to hard rock ranges from 4 to more than 10 feet.

Enon soils occur with Helena and Vance soils. They are better drained than the Helena soils and are more acid than either the Helena or Vance soils.

Enon fine sandy loam, 2 to 6 percent slopes (EnB).—This soil is on smooth interstream divides in the uplands. The surface layer is 7 to 10 inches thick and is dark brown or grayish brown to light gray. The subsoil is 10 to 30 inches thick and is reddish-yellow or yellowish-brown to olive-yellow, very firm clay loam or silty clay loam to clay that is commonly mottled with brown or red.

Included with this soil in mapping were some areas of soils that have a surface layer of silt loam. Also included were some areas in which the subsoil is more reddish than typical for this soil.

Infiltration is good, but permeability is slow and surface runoff is medium. The hazard of erosion is moderate. This soil is easy to keep in good tilth, but tillage must be restricted after heavy rains.

About two-thirds of the acreage is in forest, and the rest is in pasture or is cultivated. This soil is well suited to many of the locally grown crops. Practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIe–3, woodland suitability group 11, wildlife suitability group 1)

Enon fine sandy loam, 2 to 6 percent slopes, eroded (EnB2).—This soil is on smooth interstream divides in the uplands. The surface layer is 4 to 7 inches thick and is brown to grayish brown. In many places it is a mixture of the remaining original surface soil and of material from the subsoil. In the less eroded areas, the texture of the surface layer is fine sandy loam, but the texture ranges to sandy clay loam in the more eroded spots. The subsoil is 10 to 30 inches thick and is reddish-yellow or yellowish-brown to olive-yellow, very firm clay loam or silty clay loam to clay that has common mottles of brown or red.

Included with this soil in mapping were areas of soils that have a surface layer of silt loam. Also included were some areas of soils that have a more reddish subsoil than this soil. Other inclusions consist of some severely eroded spots where the subsoil is exposed. These severely eroded spots make up from 5 to 25 percent of the acreage in the mapping unit.

Infiltration is fair, but permeability is slow and surface runoff is medium. The hazard of further erosion is moderate. This soil is difficult to keep in good tilth. Because of the slowly permeable subsoil, however, tillage is restricted after heavy rains. A crust forms on the severely eroded spots after hard rains, and clods form if those areas are worked when wet. The crust and the clods interfere with germination. As a result, stands of crops are poor and replanting of the severely eroded areas is sometimes necessary.

About two-thirds of the acreage is in forest, and the rest is in pasture or is cultivated. This soil is well suited to many of the locally grown crops, but practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIe–3, woodland suitability group 11, wildlife suitability group 1)

Enon fine sandy loam, 6 to 10 percent slopes (EnC).—This soil is on narrow side slopes in the uplands. It has a surface layer of dark-brown or grayish-brown to light-gray fine sandy loam 7 to 10 inches thick. The subsoil is 10 to 25 inches thick and is reddish-yellow or yellowish-brown to olive-yellow, very firm clay loam or silty clay loam to clay that has common mottles of brown or red.

Included in mapping were some soils that have a surface layer of silt loam. Also included were some areas of soils that have a more reddish subsoil than this soil.

Infiltration is good, but permeability is slow and surface runoff is rapid. The hazard of erosion is severe. This soil is easy to keep in good tilth, but tillage must be restricted after heavy rains.

About three-fourths of the acreage is in forest, and the rest is in pasture or is cultivated. This soil is well suited to many of the locally grown crops. Intensive practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIIe–3, woodland suitability group 11, wildlife suitability group 1)

Enon fine sandy loam, 6 to 10 percent slopes, eroded (EnC2).—This soil is on narrow side slopes in the uplands. Its surface layer is 4 to 7 inches thick and is brown to grayish brown. In many places it is a mixture of the remaining original surface soil and of material from the subsoil. In the less eroded areas, the texture of the surface layer is fine sandy loam. In the more eroded spots, the texture ranges to sandy clay loam. The subsoil is 10 to 25 inches thick and is reddish-yellow or yellowish-brown to olive-yellow, very firm clay loam or silty clay loam to clay that has common mottles of brown or red.

Included with this soil in mapping were some areas of soils that have a surface layer of silt loam. Also included were some areas of soils that have a more reddish subsoil than this soil. Other inclusions consist of severely eroded areas where the subsoil is exposed. These severely eroded spots make up from 5 to 25 percent of the mapping unit.

Infiltration is fair, but permeability is slow and surface runoff is rapid. The hazard of further erosion is severe. This soil is difficult to keep in good tilth. Because of the slowly permeable subsoil, tillage is restricted after

heavy rains. A crust forms on the severely eroded spots after hard rains, and clods form if those areas are worked when wet. The crust and the clods interfere with germination. As a result, stands of crops are poor and replanting is sometimes necessary.

About three-fourths of the acreage is in forest, and the rest is in pasture or is cultivated. This soil is well suited to many of the locally grown crops. Intensive practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIIe–3, woodland suitability group 11, wildlife suitability group 1)

Enon fine sandy loam, 10 to 15 percent slopes, eroded (EnD2).—This soil is on narrow side slopes bordering drainageways in the uplands. In most places it is moderately eroded, but some areas are only slightly eroded. In the moderately eroded areas, the surface layer is brown to grayish brown and ranges from fine sandy loam to sandy clay loam in texture. In the slightly eroded areas, it is dark-brown or grayish-brown to light-gray fine sandy loam. The surface layer is 4 to 8 inches thick. The subsoil is 10 to 20 inches thick and consists of reddish-yellow or yellowish-brown to olive-yellow, very firm clay loam or silty clay loam to clay. It has common mottles of brown or red.

Included with this soil in mapping were a few severely eroded spots where the subsoil is exposed. Also included were some areas of soils that have a redder subsoil than this soil.

Infiltration is fair to good, but permeability is slow and surface runoff is very rapid. The hazard of further erosion is very severe. Where this soil is slightly eroded, it is easy to keep in good tilth. Where it is moderately eroded, however, it is difficult to keep in good tilth. Because of the slowly permeable subsoil, tillage is restricted after hard rains and clods form if those areas are worked when wet. The crust and the clods interfere with germination. As a result, stands of crops are poor and replanting is sometimes necessary.

Most of the acreage is in forest, but a small acreage is in pasture or is cultivated. This soil is well suited to many of the locally grown crops. If it is cultivated, however, very intensive practices that effectively control runoff and erosion are needed. (Capability unit IVe–3, woodland suitability group 11, wildlife suitability group 1)

Faceville Series

The Faceville series consists of gently sloping to sloping, very deep, well-drained soils on Coastal Plain uplands in the southern part of the county and on terraces along the large streams. These soils are on broad, smooth, rounded divides where the difference in elevation is about 20 feet between the highest and the lowest points. They have formed under forest in Coastal Plain sediment and in alluvial deposits. The water table remains below the solum.

Natural fertility and the content of organic matter are low, and permeability is moderate. The available water capacity is medium, and the shrink-swell potential is low. Except in areas that have received lime, these soils are strongly acid. Response is good if suitable applications of lime and fertilizer are made.

The Faceville soils of Wake County are moderately important for farming. Most of the acreage is cultivated or in pasture, but some is in forest.

Representative profile of a Faceville sandy loam in a cultivated field 1 mile south of Holly Springs and 25 yards east of N.C. Highway No. 55:

Ap—0 to 6 inches, brown (7.5YR 4/4) sandy loam; moderate, medium and fine, granular structure; very friable when moist; many fine and medium, fibrous roots; many fine pores; few small pebbles; medium acid; abrupt, smooth boundary.

A1—6 to 10 inches, strong-brown (7.5YR 5/6) sandy loam; moderate, medium, granular structure; very friable when moist; common, fine and medium, fibrous roots; many fine pores; medium acid; clear, wavy boundary.

A2—10 to 14 inches, reddish-yellow (5YR 6/6) sandy loam; moderate, medium, granular structure; very friable when moist; few, fine, fibrous roots; many fine pores; few small pebbles; medium acid; abrupt, smooth boundary.

B21t—14 to 21 inches, strong-brown (7.5YR 5/6) clay loam; moderate, medium, subangular blocky structure; friable when moist, sticky and slightly plastic when wet; many fine pores; few thin clay films on the surfaces of peds and common thin clay films in root channels; strongly acid; clear, smooth boundary.

B22t—21 to 38 inches, yellowish-red (5YR 5/8) heavy clay loam; few, medium, distinct, strong-brown mottles; moderate, fine and medium, subangular blocky structure; friable when moist, sticky and slightly plastic when wet; few fine pores; few thin clay films; strongly acid; diffuse, smooth boundary.

B23t—38 to 51 inches, yellowish-red (5YR 5/8) clay loam; few, coarse, distinct, strong-brown (7.5YR 5/8) mottles; moderate, medium, subangular blocky structure; friable when moist, sticky and slightly plastic when wet; few fine pores; few thin clay films; common, small sesquioxide nodules; strongly acid; clear, smooth boundary.

B3—51 to 65 inches, yellowish-red (5YR 5/8) light sandy clay loam; common, coarse, distinct, red (2.5YR 4/8) mottles and common, coarse, distinct, strong-brown (7.5YR 5/8) mottles; moderate, medium, angular blocky structure; friable when moist, slightly sticky and slightly plastic when wet; common fine pores; few thin clay films in pores and around pebbles; few small pebbles; few, small sesquioxide nodules; strongly acid; clear, smooth boundary.

C—65 to 72 inches +, mottled red (10R 5/8), yellowish-red (5YR 5/6), and strong-brown (7.5YR 5/8) sandy loam; massive; friable when moist; few quartz pebbles; strongly acid.

The A horizons range from 4 to 20 inches in total thickness. Their color ranges from grayish brown or dark brown to light yellowish brown or reddish yellow in 10YR, 7.5YR, and 5YR hues. The B horizons range from 50 to 72 inches in total thickness, from strong brown to yellowish red or red in 7.5YR, 5YR, and 2.5YR hues, and from clay loam to sandy clay loam in texture. In many places the B horizons are mottled with red, strong brown, or yellow. The combined thickness of the surface layer and subsoil is more than 60 inches. Bedrock is at a depth of more than 20 feet.

Faceville soils occur with Norfolk and Orangeburg soils. They are finer textured than those soils and are more reddish than the Norfolk soils.

Faceville sandy loam, 2 to 6 percent slopes (FaB).—This soil is on broad, smooth interstream divides and on stream terraces. Its surface layer is grayish-brown to dark-brown sandy loam that ranges from 8 to 20 inches in total thickness. The subsoil is 50 to 72 inches thick and is red to yellowish-red, friable to firm clay loam or sandy clay, with common mottles of strong brown.

Included with this soil in mapping were some areas of a soil that contains an incipient, discontinuous horizon, with plinthite. Also included were a few areas where the slope is less than 2 percent.

Infiltration is good, and surface runoff is medium. The hazard of erosion is moderate. This soil is easy to keep in good tilth and can be worked throughout a wide range of moisture content.

About three-fourths of the acreage is cultivated or in pasture, and the rest is in forest or in other uses. This soil is well suited to all the locally grown crops. The cultivated areas are used chiefly for row crops, especially tobacco and cotton. Practices that effectively control runoff and erosion are needed where this soil is cultivated. (Capability unit IIe–1, woodland suitability group 6, wildlife suitability group 1)

Faceville sandy loam, 2 to 6 percent slopes, eroded (FaB2).—This soil is on broad, smooth interstream divides and on stream terraces. The surface layer is 4 to 8 inches thick. In many places it is a mixture of the remaining original surface soil and of material from the subsoil. In the less eroded areas, the surface layer is brown to light yellowish-brown sandy loam, but the color ranges to reddish brown and the texture ranges to sandy clay loam in the more eroded spots. The subsoil is 50 to 72 inches thick and consists of red to yellowish-red, friable to firm clay loam or sandy clay, with common mottles of strong brown.

Included with this soil in mapping were some severely eroded spots where the subsoil is exposed. These areas make up from 5 to 25 percent of the acreage in the mapping unit. In many places this soil has an incipient and discontinuous horizon, with plinthite.

Infiltration is fair, and surface runoff is medium. The hazard of further erosion is moderate. This soil is difficult to keep in good tilth, but it can be worked throughout a fairly wide range of moisture content. A crust forms on the severely eroded spots after hard rains, and clods form if those areas are worked when wet. The crust and the clods interfere with germination. As a result, stands of crops are poor and replanting of the severely eroded areas may be necessary. An even stand of tobacco is hard to obtain. Plants in an uneven stand mature at different times. This makes harvesting and curing of the crop difficult and reduces the quality of the tobacco.

About three-fourths of the acreage is cultivated or in pasture, and the rest is in forest or in other uses. This soil is well suited to all the locally grown crops. The cultivated areas are used chiefly for row crops, especially tobacco and cotton. Practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIe–1, woodland suitability group 6, wildlife suitability group 1)

Faceville sandy loam, 6 to 10 percent slopes, eroded (FaC2).—This soil is on stream terraces and on narrow side slopes in the uplands. The surface layer is 4 to 8 inches thick. In many places it is a mixture of the remaining original surface soil and of material from the subsoil. In the less eroded areas, the surface layer is brown to light yellowish-brown sandy loam, but the color ranges to reddish brown and the texture ranges to sandy clay loam in the more eroded spots. The subsoil is 50 to 60 inches thick and consists of red to yellowish-red, friable to firm clay loam or sandy clay, with common mottles of strong brown.

Included with this soil in mapping were some severely eroded spots where the subsoil is exposed. These make up from 5 to 25 percent of the acreage in the mapping unit. In many places this soil contains an incipient and discontinuous horizon, with plinthite.

Infiltration is fair, and surface runoff is rapid. The hazard of further erosion is severe. This soil is difficult to keep in good tilth, but it can be worked throughout a fairly wide range of moisture content. A crust forms on the severely eroded spots after hard rains, and clods form if those areas are worked when wet. The crust and the clods interfere with germination. As a result, stands of crops are poor and replanting of those areas may be necessary. An even stand of tobacco is hard to obtain. Plants in an uneven stand mature at different times. This makes harvesting and curing of the crop difficult and reduces the quality of the tobacco.

About two-thirds of the acreage is cultivated or in pasture, and the rest is in forest or in other uses. This soil is well suited to all the locally grown crops. The cultivated areas are used chiefly for row crops, especially tobacco and cotton. Practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIIe–1, woodland suitability group 6, wildlife suitability group 1)

Georgeville Series

The Georgeville series consists of gently sloping to strongly sloping, deep, well-drained soils on Piedmont uplands. These soils are on rounded divides where the difference in elevation is about 35 feet between the highest and the lowest points. They are mostly in the western and southern parts of the county, where they have formed under forest. The material in which they formed has weathered from phyllite (Carolina slate).

Natural fertility and the content of organic matter are low, and permeability is moderate. The available water capacity is medium, and the shrink-swell potential is moderate. Except in areas that have received lime, these soils are medium acid to strongly acid. Response is good if suitable applications of lime and fertilizer are made.

The Georgeville soils of Wake County are fairly important for farming, but much of the acreage is in forest.

Representative profile of a Georgeville silt loam in a pine forest near the Seaboard Coast Line Railroad, 1¼ miles southwest of the town of Cary and two-thirds of a mile north of U.S. Highway No. 1:

Ap—0 to 5 inches, yellowish-brown (10YR 5/4) silt loam; weak, medium and coarse, granular structure; very friable when moist; many fine, fibrous and woody roots; medium acid; abrupt, smooth boundary.

B1—5 to 9 inches, yellowish-red (5YR 5/8) silty clay loam; moderate, medium and fine, subangular blocky structure; friable when moist, sticky and slightly plastic when wet; few, fine, woody roots; medium acid; abrupt, smooth boundary.

B21—9 to 30 inches, red (2.5YR 4/8) clay; strong, medium and fine, subangular blocky structure; firm when moist, sticky and plastic when wet; few, fine, woody roots; medium clay films; medium acid; clear, smooth boundary.

B22—30 to 40 inches, red (2.5YR 4/8) clay; few, fine, prominent, brownish-yellow mottles; strong, medium and fine, subangular blocky structure; firm when moist, sticky and plastic when wet; few, fine, woody roots; medium clay films; few fine mica flakes in lower part of horizon; this layer is somewhat more friable and contains less clay than the B21 horizon; strongly acid; clear, wavy boundary.

B31—40 to 49 inches, red (2.5YR 4/6) silty clay; common, coarse, distinct, dark reddish-brown (2.5YR 3/4) mottles and a few, coarse, prominent, brownish-yellow (10YR 6/8) mottles that contain less clay than the soil material in the matrix; moderate, medium and fine, subangular blocky structure; friable when moist, sticky and plastic when wet; medium clay films; few fine mica flakes; strongly acid; clear, wavy boundary.

B32—49 to 55 inches, red (2.5YR 4/6) silty clay loam; many, fine, distinct, weak-red to dusky-red (purplish cast) mottles and common, coarse, prominent, brownish-yellow (10YR 6/8) mottles; moderate, medium, subangular blocky structure; friable when moist, sticky and plastic when wet; few thin clay films; few fine mica flakes that increase in number with depth; pockets of saprolite associated with the mottles; strongly acid; clear, wavy boundary.

C—55 to 92 inches +, mottled yellow and red (purplish cast) silt loam that is disintegrated phyllite; massive; some accumulation of clay in vertical cracks; strongly acid.

The Ap horizon ranges from 3 to 8 inches in thickness and from dark grayish brown or grayish brown to yellowish brown in color. The B horizons range from 30 inches to 55 inches in total thickness and from silty clay loam to clay in texture. The color of the B2 horizons is red in 2.5YR hue. The combined thickness of the A and B horizons is 33 to 60 inches. Depth to hard rock ranges from 5 to more than 15 feet.

The Georgeville soils occur with Cecil, Lloyd, and Herndon soils. They contain more silt and less sand than the Cecil soils, and they contain more silt and are not so dark a red as the Lloyd soils. They are redder than the Herndon soils.

Georgeville silt loam, 2 to 6 percent slopes (GeB).—This soil is on smooth interstream divides in the uplands. Its surface layer is dark grayish-brown to yellowish-brown silt loam 4 to 8 inches thick. The subsoil is red, firm silty clay loam to clay 30 to 55 inches thick. In many places from 20 to 50 percent of the surface is covered with pebbles and cobblestones, and from 20 to 50 percent of the surface layer consists of pebbles and cobblestones.

Infiltration is good, and surface runoff is medium. The hazard of erosion is moderate. This soil is fairly easy to keep in good tilth and can be worked throughout a fairly wide range of moisture content.

This soil is suited to most of the locally grown crops, but about three-fourths of the acreage is in forest. The areas that have been cleared are used chiefly for row crops and pasture. Practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIe–2, woodland suitability group 5, wildlife suitability group 1)

Georgeville silt loam, 2 to 6 percent slopes, eroded (GeB2).—This soil is on smooth interstream divides in the uplands. Its surface layer is 3 to 6 inches thick. In many places it is a mixture of the remaining original surface soil and of material from the subsoil. In the less eroded spots, the surface layer is grayish-brown and yellowish-brown silt loam, but the color ranges to reddish brown and the texture ranges to silty clay loam in the more eroded spots. The subsoil is red, firm silty clay loam to clay and is 30 to 55 inches thick.

Included with this soil in mapping were some areas where from 20 to 50 percent of the surface is covered with pebbles and cobblestones and from 20 to 50 percent of the surface layer consists of pebbles and cobblestones. Also included were some severely eroded spots where the subsoil is exposed. The severely eroded areas make up from 5 to 25 percent of the acreage in the mapping unit.

Infiltration is fair, and surface runoff is medium. The hazard of further erosion is moderate. This soil is difficult to keep in good tilth and can be worked only within a rather narrow range of moisture content without puddling. A crust forms on the severely eroded spots after hard rains, and clods form if those areas are worked when wet. The crust and the clods interfere with germination. As a result, stands of crops are poor and replanting of the severely eroded spots may be necessary.

About three-fourths of the acreage is in forest. This soil is suited to most of the locally grown crops, however, and the areas that are cleared are used chiefly for row crops and pasture. Practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIe–2, woodland suitability group 5, wildlife suitability group 1)

Georgeville silt loam, 6 to 10 percent slopes (GeC).—This soil is on short to long side slopes in the uplands. Its surface layer is 4 to 6 inches thick and consists of dark grayish-brown to yellowish-brown silt loam. The subsoil is red, firm silty clay loam to clay that is 30 to 45 inches thick. Included with this soil in mapping were many areas where from 20 to 50 percent of the surface is covered with pebbles and cobblestones and from 20 to 50 percent of the surface layer consists of pebbles and cobblestones.

Infiltration is good, and surface runoff is rapid. The hazard of erosion is severe. This soil is fairly easy to keep in good tilth and can be worked throughout a fairly wide range of moisture content.

Though most of the acreage is in forest, this soil is suited to most of the locally grown crops. A small acreage that has been cleared is used chiefly for row crops and pasture. Intensive practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIIe–2, woodland suitability group 5, wildlife suitability group 1)

Georgeville silt loam, 6 to 10 percent slopes, eroded (GeC2).—This soil is on short to long side slopes in the uplands. In many places its surface layer is a mixture of the remaining original surface soil and of material from the subsoil. It is 3 to 6 inches thick. In the less eroded areas, the surface layer is a mixture of the remaining original surface soil and of material from the subsoil. In those areas it is grayish-brown to yellowish-brown silt loam, but the color ranges to reddish brown and the texture ranges to silty clay loam in the more eroded areas. The subsoil is red, firm silty clay loam to clay and is 30 to 45 inches thick.

Included with this soil in mapping were many areas where from 20 to 50 percent of the surface is covered with pebbles and cobblestones and from 20 to 50 percent of the surface layer consists of pebbles and cobblestones. Also included were some severely eroded spots where the sub-

soil is exposed. These severely eroded areas make up from 5 to 25 percent of the acreage in the mapping unit.

Infiltration is fair, and surface runoff is rapid. The hazard of further erosion is severe. This soil is difficult to keep in good tilth and can be worked only within a fairly narrow range of moisture content without puddling. A crust forms on the severely eroded spots after hard rains, and clods form if those areas are worked when wet. The crust and the clods interfere with germination. As a result, stands of crops are poor and replanting of those areas may be necessary.

Most of the acreage is in forest, but this soil is suited to many of the locally grown crops. The cleared areas are used chiefly for row crops and pasture. Intensive practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIIe–2, woodland suitability group 5, wildlife suitability group 1)

Georgeville silt loam, 10 to 15 percent slopes, eroded (GeD2).—This soil is on narrow side slopes bordering upland drainageways. It is dominantly moderately eroded, but it is only slightly eroded in places. The surface layer is 3 to 6 inches thick. In the moderately eroded areas, the surface layer is generally grayish-brown to yellowish-brown silt loam, but the color ranges to reddish brown and the texture ranges to silty clay loam. In the slightly eroded areas, the surface layer is dark grayish-brown to yellowish-brown silt loam. The subsoil is red, firm silty clay loam to clay that is 30 to 36 inches thick.

Included with this soil in mapping were areas where from 20 to 50 percent of the surface is covered with pebbles and and cobblestones, and from 20 to 50 percent of the surface layer consists of pebbles and cobblestones. Also included were some severely eroded spots where the subsoil is exposed.

Infiltration is fair to good, and surface runoff is very rapid. The hazard of further erosion is very severe. Where this soil is only slightly eroded, it is easy to keep in good tilth. Where it is moderately eroded, it is difficult to keep in good tilth and can be worked within only a narrow range of moisture content without puddling. A crust forms on the severely eroded spots after hard rains, and clods form if those areas are worked when wet. The crust and the clods interfere with germination. As a result, stands of crops are poor and replanting of those areas may be necessary.

Much of the acreage is in forest, but this soil is suited to most of the locally grown crops. Where it has been cleared, it is used chiefly for row crops and pasture. Very intensive practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IVe-2, woodland suitability group 5, wildlife suitability group 1)

Goldsboro Series

The Goldsboro series consists of nearly level and gently sloping, very deep, moderately well drained soils on Coastal Plain uplands in the southern part of the county. These soils are chiefly on broad flats or in slight depressions where the difference in elevation is about 5 feet between the highest and the lowest points. They have formed under forest in Coastal Plain deposits. A seasonally high water table is at a depth of about 2½ feet.

Natural fertility and the content of organic matter are low, permeability is moderate, and the available water capacity is medium. The shrink-swell potential is low. Except in areas that have received lime, these soils are strongly acid. Response is good if suitable applications of lime and fertilizer are made.

The Goldsboro soils of Wake County are not important for farming. Nevertheless, most of the acreage is cultivated or in pasture.

Representative profile of Goldsboro sandy loam in a cultivated field 1.1 miles south of the New Hope Church, 0.4 of a mile west on a farm road, and 30 yards south of the farm road:

Ap—0 to 10 inches, dark grayish-brown (2.5Y 4/2) sandy loam; weak, medium, granular structure; very friable when moist; common, fine, fibrous roots; many fine pores; slightly acid; abrupt, wavy boundary.

A2—10 to 15 inches, pale-yellow (2.5Y 7/4) sandy loam; weak, medium, granular structure; very friable when moist; few, fine, fibrous roots; many fine pores; slightly acid; clear, wavy boundary.

B21t—15 to 18 inches, yellowish-brown (10YR 5/6) sandy clay loam; few, medium, distinct, strong-brown mottles; weak, medium and fine, subangular blocky structure; friable when moist, slightly sticky and slightly plastic when wet; few, fine, fibrous roots; thin, clay films on sand grains; many fine pores; strongly acid; abrupt, smooth boundary.

B22t—18 to 26 inches, yellowish-brown (10YR 5/4) sandy clay loam; many, medium, prominent, strong-brown mottles; moderate, medium and fine, subangular blocky structure; friable when moist, slightly sticky and slightly plastic when wet; medium clay films; common fine pores; strongly acid; clear, smooth boundary.

B23t—26 to 30 inches, yellowish-brown (10YR 5/6) sandy clay loam; many, medium, prominent, light brownish-gray mottles; moderate, medium and fine, subangular blocky structure; slightly brittle in place; friable when moist, slightly sticky and slightly plastic when wet; few thin clay films; strongly acid; clear, smooth boundary.

B3t—30 to 61 inches, mottled yellowish-brown (10YR 5/6), light brownish-gray (10YR 6/2) to gray (10YR 6/1), and red (2.5YR 4/8) sandy clay loam; moderate, medium and fine, subangular blocky structure; slightly brittle in place; friable when moist, slightly sticky and slightly plastic when wet; few thin clay films; common fine pores; strongly acid; clear, smooth boundary.

C—61 to 72 inches +, mottled red (10R 4/6), gray (N 6/0), and yellowish-brown (10YR 5/6) sandy loam; massive; brittle in place; friable when moist, slightly sticky and slightly plastic when wet; strongly acid.

The A horizons range from 6 to 20 inches in total thickness and from light gray to very dark grayish brown in color. The B horizons range from 46 to 60 inches in combined thickness and from sandy loam to sandy clay loam in texture. The color of the B horizons is pale brown to yellowish brown of 10YR hue. Gray mottles are at a depth of 10 to 20 inches below the top of the B21t horizon. The combined thickness of the A and B horizons is more than 60 inches. Depth to hard rock is more than 20 feet.

Goldsboro soils occur with Norfolk and Lynchburg soils. They are not so well drained as the Norfolk soils and are better drained than the Lynchburg soils.

Goldsboro sandy loam (0 to 4 percent slopes) (Go).—This is the only Goldsboro soil mapped in Wake County.

It has a surface layer of light-gray to very dark grayish-brown sandy loam 6 to 20 inches thick. The subsoil is 46 to 60 inches thick and is pale-brown to yellowish-brown, friable sandy loam to sandy clay loam that is mottled with gray in the lower part. In many places this soil contains an incipient and discontinuous horizon, with plinthite. Included in mapping were some areas of a soil that has a finer textured subsoil than is typical for this soil.

Infiltration is good, and surface runoff is slow. This soil is easy to keep in good tilth and can be worked throughout a wide range of moisture content. It is used chiefly for row crops, especially tobacco, but it is well suited to all the locally grown crops. In places some drainage is necessary for crops that require good drainage. (Capability unit IIw–1, woodland suitability group 4, wildlife suitability group 1)

Granville Series

The Granville series consists of gently sloping to strongly sloping, deep, well-drained soils on Piedmont uplands in the western part of the county. These soils are on rounded divides that have a difference in elevation of about 20 feet between the highest and the lowest points. They have formed under forest in material that weathered from sandstone, shale, and mudstone of Triassic age. The water table remains below the solum.

Natural fertility and the content of organic matter are low, permeability is moderate, and the available water capacity is medium. The shrink-swell potential is moderate to low. These soils have a high content of aluminum. Except in areas that have received lime, they are strongly acid. Response is good if suitable applications of lime and fertilizer are made.

The Granville soils of this county are moderately important for farming. Most of the acreage is cultivated or in pasture.

Representative profile of a Granville sandy loam in a cultivated field one-fourth of a mile west of the Salem Church and 600 feet west of road:

Ap—0 to 6 inches, brown (10YR 5/3) sandy loam; weak, medium and coarse, granular structure; very friable when moist; many fine, fibrous roots; common small pebbles; medium acid; abrupt, smooth boundary.

A2—6 to 12 inches, very pale brown (10YR 7/4) sandy loam; weak, medium and coarse, granular structure; very friable when moist; common, fine, fibrous roots; few small pebbles; medium acid; clear, wavy boundary.

B1—12 to 15 inches, brownish-yellow (10YR 6/6) sandy clay loam; weak, medium, subangular blocky structure; friable when moist, slightly sticky and slightly plastic when wet; few, fine, fibrous roots; medium acid; clear, smooth boundary.

B21t—15 to 20 inches, yellowish-brown (10YR 5/8) clay loam; moderate, medium and fine, subangular blocky structure; friable when moist, slightly sticky and slightly plastic when wet; few thin clay films; strongly acid; clear, smooth boundary.

B22t—20 to 31 inches, yellowish-brown (10YR 5/8) clay loam; few, coarse, prominent, yellowish-red (5YR 5/8) mottles; moderate, medium and fine, subangular blocky structure; friable when moist, slightly sticky and slightly plastic when wet; few thin clay films; strongly acid; clear, smooth boundary.

B3t—31 to 41 inches, brownish-yellow (10YR 6/8) clay loam; many, coarse, prominent, red (2.5YR 5/8) mottles and common, coarse, distinct, very pale brown (10YR 7/3) mottles; moderate, fine, subangular blocky structure; friable when moist, slightly sticky and slightly plastic when wet; common thin clay films; common small pebbles; red mottles appear to be weathered parent material; strongly acid; gradual, smooth boundary.

C—41 to 50 inches +, layered red, light-gray, and strong-brown clay; thick platy primary structure breaking to strong, medium, angular and subangular blocky structure; firm when moist, sticky and plastic when wet; thick silt coatings; common rounded pebbles as large as 3 inches in diameter; red material is hard and brittle; strongly acid.

The A horizons range from 6 to 20 inches in total thickness and from brown or dark brown to pale yellow in color. The Bt horizons range from 26 inches to 50 inches in combined thickness, from clay loam to sandy clay loam in texture, and from yellow to strong brown in color. From 5 to 10 percent of the profile generally consists of rounded and angular pebbles.

Granville soils occur with Durham, Mayodan, and Creedmoor soils. They contain more exchangeable aluminum than the Durham soils, have a less reddish subsoil than the Mayodan soils, and have a coarser textured, less firm and less plastic lower subsoil than the Creedmoor soils. Granville soils are better drained than the Creedmoor soils.

Granville sandy loam, 2 to 6 percent slopes (GrB).—This soil is on broad, smooth interstream divides in the uplands. It has a dark-brown or brown to pale-yellow surface layer that is 7 to 20 inches thick. The subsoil is 26 to 50 inches thick and consists of yellow to strong-brown, friable clay loam or sandy clay loam, with common mottles of yellowish red.

Included with this soil in mapping were a few areas where the slope is less than 2 percent. Also included were areas where from 20 to 50 percent of the surface is covered with gravel and from 20 to 50 percent of the surface layer is gravel.

Infiltration is good, and surface runoff is medium. The hazard of erosion is moderate. This soil is easy to keep in good tilth and can be worked throughout a wide range of moisture content.

This soil is well suited to most of the locally grown crops, and most of the acreage is cultivated or in pasture. Row crops, especially tobacco and cotton, are the main crops grown. Practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIe–1, woodland suitability group 5, wildlife suitability group 1)

Granville sandy loam, 2 to 6 percent slopes, eroded (GrB2).—This soil is on broad, smooth interstream divides in the uplands. Its surface layer is 6 to 8 inches thick. In many places it is a mixture of the remaining original surface soil and of material from the subsoil. In the less eroded areas, the surface layer is brown to pale-yellow sandy loam, but the color ranges to strong brown and the texture ranges to sandy clay loam in the more eroded spots. The subsoil is 26 to 50 inches thick and is yellow to strong-brown, friable clay loam or sandy clay loam that has common mottles of yellowish red.

Included with this soil in mapping were some areas where from 20 to 50 percent of the surface is covered with gravel and from 20 to 50 percent of the surface layer is gravel. Also included were some severely eroded

spots that make up from 5 to 25 percent of the acreage in the mapping unit.

Infiltration is fair, and surface runoff is medium. The hazard of further erosion is moderate. This soil is difficult to keep in good tilth, but it can be worked throughout a fairly wide range of moisture content. A crust forms on the severely eroded spots after hard rains, and clods form if those areas are worked when wet. The crust and the clods interfere with germination. As a result, stands of crops are poor and replanting of those areas is sometimes necessary. An even stand of tobacco is hard to obtain. Plants in an uneven stand mature at different times. This makes harvesting and curing of the crop difficult and reduces the quality of the tobacco.

This soil is well suited to most of the locally grown crops, and most of the acreage is cultivated or in pasture. The cultivated areas are used chiefly for row crops, especially tobacco and cotton. Practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIe–1, woodland suitability group 5, wildlife suitability group 1)

Granville sandy loam, 6 to 10 percent slopes (GrC).—This soil is on narrow side slopes in the uplands. It has a dark-brown or brown to pale-yellow surface layer that ranges from 7 to 15 inches in total thickness. The subsoil is 26 to 45 inches thick and consists of yellow to strong-brown, friable clay loam or sandy clay loam, with common mottles of yellowish red. Included with this soil in mapping were some areas where from 20 to 50 percent of the surface is covered with gravel and from 20 to 50 percent of the surface layer consists of gravel.

Infiltration is good, and surface runoff is rapid. The hazard of erosion is severe. This soil is easy to keep in good tilth and can be worked throughout a wide range of moisture content.

About two-thirds of the acreage is cultivated or in pasture, and the rest is in forest or in other uses. This soil is well suited to most of the locally grown crops. The cultivated areas are used chiefly for row crops, especially tobacco and cotton. Intensive practices that effectively control runoff and erosion are needed in the cultivated areas (fig. 5). (Capability unit IIIe–1, woodland suitability group 5, wildlife suitability group 1)

Figure 5.—Stripcropping in a field of Granville sandy loam, 6 to 10 percent slopes. Water from the ponds is used for irrigation.

Granville sandy loam, 6 to 10 percent slopes, eroded (GrC2).—This soil is on narrow side slopes in the uplands. Its surface layer is 6 to 8 inches thick. In many places the surface layer is a mixture of the remaining original surface soil and of material from the subsoil. In the less eroded areas, the surface layer is brown to pale-yellow sandy loam, but the color ranges to strong brown and the texture ranges to sandy clay loam in the more eroded spots. The subsoil is 26 to 45 inches thick and consists of yellow to strong-brown, friable clay loam or sandy clay loam, with common mottles of yellowish red.

Included with this soil in mapping were some areas where from 20 to 50 percent of the surface is covered with gravel and where from 20 to 50 percent of the surface layer consists of gravel. Also included were some severely eroded spots that make up from 5 to 25 percent of the acreage in the mapping unit.

Infiltration is fair, and surface runoff is rapid. The hazard of further erosion is severe. This soil is difficult to keep in good tilth, but it can be worked throughout a fairly wide range of moisture content. A crust forms on the severely eroded spots after hard rains, and clods form if those areas are worked when wet. The crust and the clods interfere with germination. As a result, stands of crops are poor and replanting of those areas may be necessary. An even stand of tobacco is hard to obtain. Plants in an uneven stand mature at different times, which makes harvesting and curing of the crop difficult and reduces the quality of the tobacco.

About two-thirds of the acreage is cultivated or in pasture, and the rest is in forest or in other uses. This soil is well suited to most of the locally grown crops. Row crops, especially tobacco and cotton, are grown in the cultivated areas, and other crops are grown to a lesser extent. Practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIIe–1, woodland suitability group 5, wildlife suitability group 1)

Granville sandy loam, 10 to 15 percent slopes (GrD).—This soil is in the uplands. It has a dark-brown or brown to pale-yellow surface layer 7 to 12 inches thick. The subsoil is 26 to 40 inches thick and is yellow to strong-brown, friable clay loam or sandy clay loam that has common mottles of yellowish red.

Included with this soil in mapping were some areas where from 20 to 50 percent of the surface is covered with gravel and from 20 to 50 percent of the surface layer consists of gravel. Also included were some severely eroded spots where the subsoil is exposed.

Infiltration is good, and surface runoff is very rapid. The hazard of erosion is very severe. This soil is easy to keep in good tilth, and it can be worked throughout a wide range of moisture content.

About half of the acreage is cultivated or in pasture, and the rest is in forest. This soil is well suited to most of the locally grown crops, and the cultivated areas are used chiefly for row crops. Very intensive practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IVe–1, woodland suitability group 5, wildlife suitability group 1)

Gullied land (Gu) is a miscellaneous land type consisting of areas that have eroded beyond feasible reclamation. Erosion has removed practically all of the original surface layer and, in places, much of the subsoil from the original soils. More than one-fourth of the acreage consists of gullies. Tillage equipment can be operated across some of the gullies but will not obliterate them. In some areas the gullies are too deep and too numerous to be smoothed, even if heavy equipment is used. Some gullies have cut into the weathered rock that underlies the area. The uppermost part of the soil material is clay.

The rate of infiltration is slow. Most of the water from rainfall runs off the surface very rapidly.

This land type can be used for growing pines, but growth of the trees will be slow. (Capability unit VIIe–1, woodland suitability group 13, wildlife suitability group 5)

Helena Series

The Helena series consists of gently sloping to strongly sloping, deep, moderately well drained soils that occupy small areas on Piedmont uplands. These soils are in the northern part of the county and are on side slopes and on rounded divides that have a difference in elevation of about 30 feet between the highest and the lowest points. They have formed under forest in material that weathered from mixed acidic and basic rocks. The water table remains below the solum most of the time. During wet seasons, however, these soils contain a perched water table as a result of their slowly permeable subsoil.

Natural fertility and the content of organic matter are low, and permeability is slow. The available water capacity is medium, and the shrink-swell potential is high. Except in areas that have received lime, these soils are strongly acid or very strongly acid. Response is good if suitable applications of lime and fertilizer are made.

The Helena soils of Wake County are not important for farming. Most of the acreage is in forest or pasture.

Representative profile of a Helena sandy loam in a cultivated field 150 feet north of a paved road and 2.2 miles east of the Wake Finishing Plant:

Ap—0 to 8 inches, grayish-brown (2.5Y 5/2) sandy loam; weak, fine and medium, granular structure; very friable when moist; many fine, fibrous roots; medium acid; abrupt, smooth boundary.

B1—8 to 10 inches, pale-brown (2.5Y 7/4) light sandy clay loam; common, medium, prominent, brownish-yellow mottles; weak, medium, subangular blocky structure; friable when moist, sticky and slightly plastic when wet; few, fine, fibrous roots; medium acid; abrupt, smooth boundary.

B21t—10 to 22 inches, brownish-yellow (10YR 6/6) sandy clay; many, coarse, prominent, light yellowish-brown (10YR 6/4) mottles; weak, medium, angular blocky structure; very firm when moist, sticky and very plastic when wet; distinct clay films on ped surfaces; strongly acid; gradual, smooth boundary.

B22t—22 to 27 inches, brownish-yellow (10YR 6/6) clay; common, coarse, prominent, gray (10YR 6/1) mottles; weak, medium, angular blocky structure; very firm when moist, sticky and very plastic when wet; thin clay films; very strongly acid; gradual, smooth boundary.

B23t—27 to 32 inches, light-gray (2.5Y 7/2) sandy clay to clay; many, coarse, prominent, brownish-yellow (10YR 6/6) mottles; weak, medium and coarse, angular blocky structure; very firm when moist, sticky and very plastic when wet; thin clay films; very strongly acid; gradual, smooth boundary.

B3t—32 to 36 inches, gray (10YR 6/1) sandy clay; few, coarse, prominent, brownish-yellow (10YR 6/6) mottles; weak, coarse, angular blocky structure approaching massive; firm when moist, sticky and plastic when wet; few thin clay films; strongly acid; clear, smooth boundary.

C—36 to 39 inches +, mottled light-gray and brownish-yellow sandy clay loam that is disintegrated, acid crystalline rock.

The A horizon ranges from 3 to 15 inches in thickness and from grayish brown, dark grayish brown, or light brownish gray to pale yellow in color. In places the B1 horizon is absent. Where it occurs, it ranges from 2 to 10 inches in thickness and from sandy clay loam to sandy clay in texture. The modal color of the Bt horizons is yellowish brown, but the color ranges from brownish yellow, yellow, or olive to strong brown or light gray. Gray mottling occurs below the uppermost 10 inches of the B21t horizon. The B2t horizons range from 10 inches to 30 inches in combined thickness and from clay to sandy clay in texture. The combined thickness of the A horizon and B horizons ranges from 20 to 60 inches. Depth to hard rock ranges from 4 to 15 feet or more.

Helena soils occur with Durham, Appling, Wedowee, Vance, Enon, Wilkes, Colfax, and Creedmoor soils. They are less well drained than the Durham, Appling, Wedowee, Vance, Enon, and Wilkes soils, and they have a finer textured subsoil than the Durham, Colfax, and Wedowee soils. Helena soils are less brown and are more acid than the Enon soils. They have a thicker surface layer and subsoil than the Wilkes soils, are better drained than the Colfax soils, and contain less exchangeable aluminum than the Creedmoor soils.

Helena sandy loam, 2 to 6 percent slopes (HeB).—This soil is on smooth interstream divides. It has a dark grayish-brown to light brownish-gray surface layer 7 to 15 inches thick. The subsoil is 10 to 30 inches thick. It consists of yellow to strong-brown sandy clay or clay that is very firm when moist and very plastic when wet. The subsoil contains common gray mottles.

Infiltration is good, but permeability is slow and surface runoff is medium. The hazard of erosion is moderate. This soil is easy to keep in good tilth. Because of the slowly permeable subsoil, however, tillage is restricted after heavy rains.

About half of the acreage is cultivated or in pasture, and the rest is in forest. This soil is fairly well suited to most of the locally grown crops. Where it has been cleared, it is used chiefly for row crops. Practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIe–3, woodland suitability group 11, wildlife suitability group 1)

Helena sandy loam, 2 to 6 percent slopes, eroded (HeB2).—This soil is on smooth interstream divides. Its surface layer is 3 to 7 inches thick. In many places it is a mixture of the remaining original surface soil and of material from the subsoil. In the less eroded areas, the surface layer is pale-yellow or light brownish-gray sandy loam, but the color ranges to strong brown and the texture ranges to clay loam in the more eroded spots. The subsoil is 10 to 30 inches thick. It consists of yellow to strong-brown sandy clay or clay that has common gray mottles and is very firm when moist and very plastic when wet.

Included with this soil in mapping were some severely eroded spots where the subsoil is exposed. These spots make up from 5 to 25 percent of the acreage in the mapping unit.

Infiltration is fair, but permeability is slow and runoff is medium. The hazard of further erosion is severe. This soil is difficult to keep in good tilth. Because of the slowly permeable subsoil, tillage is restricted after heavy rains. A crust forms on the severely eroded spots after hard rains, and clods form if those areas are worked when wet. The crust and the clods interfere with germination. As a result, stands of crops are poor and replanting of the severely eroded spots is sometimes necessary. An even stand of tobacco is hard to obtain. Plants in an uneven stand mature at different times. This makes harvesting and curing of the crop difficult and reduces the quality of the tobacco.

About half of the acreage is cultivated or in pasture, and the rest is in forest. This soil is fairly well suited to most of the locally grown crops. Where it has been cleared, it is used chiefly for row crops. Intensive practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIIe–3, woodland suitability group 11, wildlife suitability group 1)

Helena sandy loam, 6 to 10 percent slopes (HeC).—This soil is on narrow side slopes in the uplands. Its surface layer is dark grayish-brown to light brownish-gray sandy loam 7 to 14 inches thick. The subsoil is 10 to 26 inches thick and consists of yellow to strong-brown sandy clay loam to clay, with common mottles of gray. It is very firm when moist and very plastic when wet.

Infiltration is good, but permeability is slow and surface runoff is rapid. The hazard of further erosion is severe. This soil is easy to keep in good tilth, but tillage is restricted after heavy rains because of the slowly permeable subsoil.

About one-fourth of the acreage is cultivated or in pasture, and the rest is in forest. This soil is fairly well suited to most of the locally grown crops. Where it has been cleared, it is used chiefly for row crops. Intensive practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIIe–3, woodland suitability group 11, wildlife suitability group 1)

Helena sandy loam, 6 to 10 percent slopes, eroded (HeC2).—This soil is on narrow side slopes in the uplands. Its surface layer is 3 to 7 inches thick. In many places it is a mixture of the remaining original surface soil and of material from the subsoil. In the less eroded areas, the surface layer is pale-yellow to light brownish-gray sandy loam, but the color ranges to strong brown and the texture ranges to clay loam in the more eroded spots.

Included with this soil in mapping were some severely eroded spots where the subsoil is exposed. These areas make up from 5 to 25 percent of the acreage in the mapping unit.

Infiltration is fair, but permeability is slow and runoff is rapid. The hazard of further erosion is very severe. This soil is difficult to keep in good tilth. Tillage is restricted after heavy rains because of the slowly permeable subsoil. A crust forms on the severely eroded spots after hard rains, the clods form if those areas are worked when wet. The crust and the clods interfere with germination. As a result, stands of crops are poor and replanting of the severely eroded spots is sometimes necessary. An even stand of tobacco is hard to obtain. Plants in an uneven stand mature at different times. This makes har-

vesting and curing of the crop difficult and reduces the quality of the tobacco.

About one-fourth of the acreage is cultivated or in pasture, and the rest is in forest. This soil is fairly well suited to most of the locally grown crops. Where it has been cleared, it is used chiefly for row crops. Very intensive practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IVe-3, woodland suitability group 11, wildlife suitability group 1)

Helena sandy loam, 10 to 15 percent slopes (HeD).—This is a slightly to moderately eroded soil on narrow side slopes bordering upland drainageways. In the slightly eroded areas, the surface layer is dark grayish-brown to light brownish-gray sandy loam 6 to 12 inches thick. In the moderately eroded areas, the surface layer is grayish-brown or pale-yellow sandy loam to strong-brown clay loam and is 3 to 7 inches thick. The subsoil is 10 to 24 inches thick and consists of yellow to strong-brown sandy clay or clay, with common gray mottles. It is very firm when moist and very plastic when wet. Included with this soil in mapping were some severely eroded spots where the subsoil is exposed.

Infiltration is good, but permeability is slow and surface runoff is very rapid. The hazard of further erosion is very severe.

Where this soil has been cleared, it is used chiefly for row crops, but it is fairly well suited to most of the locally grown crops. Most of the acreage is in forest, but a small acreage is cultivated or in pasture. Very intensive practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IVe-3, woodland suitability group 11, wildlife suitability group 1)

Herndon Series

The Herndon series consists of gently sloping to moderately steep, deep, well-drained soils of Piedmont uplands. These soils occupy small areas in the western, southern, and eastern parts of the county. They are on side slopes and on rounded divides that have a difference in elevation of about 50 feet between the highest and the lowest points. The soils have formed under forest in material that weathered from phyllite (Carolina slates). The water table remains below the solum.

Natural fertility and the content of organic matter are low, and permeability is moderate. The available water capacity is medium, and the shrink-swell potential is moderate. Except in areas that have received lime, these soils are medium acid to strongly acid. Response is good if suitable applications of lime and fertilizer are made.

The Herndon soils of Wake County are not important for farming. Most of the acreage is in forest.

Representative profile of a Herndon silt loam in a wooded area 1.4 miles south of U.S. Highway No. 1 and 10 yards south of county road No. 1010:

O1—2 inches to 0, undecomposed and partly decomposed pine litter.

Ap—0 to 6 inches, yellowish-brown (10YR 5/4) silt loam; weak, medium and fine, granular structure; very friable when moist; common, fine and medium, woody roots; many fine pores; common, small and medium, subrounded quartz pebbles; strongly acid; clear, wavy boundary.

B1—6 to 9 inches, strong-brown (7.5YR 5/8) silty clay loam; weak, medium, subangular blocky structure; friable when moist, slightly sticky and slightly plastic when wet; common, fine, woody roots; many fine pores; strongly acid; clear, smooth boundary.

B21t—9 to 20 inches, yellowish-red (5YR 5/8) silty clay loam; strong, medium and fine, subangular blocky structure; friable when moist, sticky and plastic when wet; few, fine, woody roots; common fine pores; thick, yellowish-red (5YR 5/8) clay films on ped surfaces; strongly acid; clear, smooth boundary.

B22t—20 to 30 inches, yellowish-red (5YR 5/6) silty clay; many, fine, prominent, red mottles and many, fine, prominent, brownish-yellow mottles; strong, medium and fine, subangular blocky structure; friable when moist, sticky and plastic when wet; thick and moderately thick clay films; few, fine and medium, woody roots; few fine pores; thick and moderately thick, continuous clay films; strongly acid; clear, smooth boundary.

B3t—30 to 40 inches, mottled dark-red, red, and yellow silty clay loam; moderate, medium and fine, subangular blocky structure; friable when moist, sticky and plastic when wet; common fine pores; thin clay films; strongly acid; abrupt, smooth boundary.

C—40 to 45 inches +, mottled red, yellow, white, and yellowish-red silty clay loam; massive; friable when moist; strongly acid.

The A horizon ranges from 3 to 8 inches in thickness and from very dark grayish brown or brown to yellowish brown in color. The B horizons range from 20 to 45 inches in thickness and from silty clay loam to silty clay in texture. The color of the B2t horizons range from strong brown to yellowish red in 7.5YR and 5YR hues. In many places those horizons contain common mottles of red or yellow. The combined thickness of the A and B horizons ranges from 36 to 48 inches. Depth to hard rock ranges from 5 to more than 15 feet.

Herndon soils occur with Appling, Georgeville, and Mayodan soils. They have more silt and less sand throughout the profile than do the Appling soils. Herndon soils are less red than the Georgeville soils and have more silt throughout their profile than the Mayodan soils.

Herndon silt loam, 2 to 6 percent slopes (HrB).—This soil is on smooth interstream divides in the uplands. It has a very dark grayish-brown or brown to yellowish-brown surface layer 5 to 8 inches thick. The subsoil is 20 to 45 inches thick. It consists of yellowish-red to strong-brown, friable silty clay loam to silty clay that contains common mottles of red or yellow. Included in mapping were many areas where from 20 to 50 percent of the surface is covered with pebbles and cobblestones and from 20 to 50 percent of the surface layer consists of pebbles and cobblestones.

Infiltration is good, and surface runoff is medium. The hazard of erosion is moderate. This soil is fairly easy to keep in good tilth, and it can be worked throughout a wide range of moisture content.

Most of the acreage is in forest, but a small acreage is cultivated or in pasture. This soil is well suited to most of the locally grown crops. Where it has been cleared, it is used chiefly for row crops and pasture. Practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIe-2, woodland suitability group 5, wildlife suitability group 1)

Herndon silt loam, 2 to 6 percent slopes, eroded (HrB2).—This soil is in the uplands. In many places its

surface layer is a mixture of the remaining original surface soil and of material from the subsoil. The surface layer is 4 to 6 inches thick. In the less eroded areas, it is brown and yellowish-brown silt loam, but the color ranges to strong brown and the texture ranges to silty clay loam in the more eroded spots. The subsoil is 20 to 45 inches thick. It consists of yellowish-red to strong-brown, friable silty clay loam to silty clay that has common mottles of red or yellow.

Included with this soil in mapping were many areas where from 20 to 50 percent of the surface is covered with pebbles and cobblesstones, and from 20 to 50 percent. of the surface layer consists of pebbles and cobblestones. Also included were some severely eroded spots where the subsoil is exposed. These severely eroded spots make up from 5 to 25 percent of the acreage in the mapping unit.

Infiltration is fair, and surface runoff is medium. The hazard of further erosion is moderate. This soil is difficult to keep in good tilth and can be worked within only a fairly narrow range of moisture content without puddling. A crust forms on the severely eroded spots after hard rains, and clods form if those areas are worked when wet. The crust and the clods interfere with germination. As a result, stands of crops are poor and replanting of those areas is sometimes necessary.

Most of the acreage is in forest, but a small acreage is cultivated or in pasture. The cultivated areas are used chiefly for row crops, but this soil is well suited to most other locally grown crops. Practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIe–2, woodland suitability group 5, wildlife suitability group 1)

Herndon silt loam, 6 to 10 percent slopes (HrC).—This soil is on short side slopes in the uplands. It has a very dark grayish-brown or brown to yellowish-brown surface layer 5 to 7 inches thick. The subsoil is 20 to 40 inches thick. It is yellowish-red to strong-brown, friable silty clay loam to silty clay and contains common mottles of red or yellow. Included in mapping were many areas where from 20 to 50 percent of the surface is covered with pebbles and cobblestones, and from 20 to 50 percent of the surface layer consists of pebbles and cobblestones.

Infiltration is good, and surface runoff is rapid. The hazard of erosion is severe. This soil is fairly easy to keep in good tilth and can be worked throughout a wide range of moisture content.

A large part of the acreage is in forest, but this soil is well suited to most of the locally grown crops. Where it has been cleared, it is used chiefly for row crops. Intensive practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIIe–2, woodland suitability group 5, wildlife suitability group 1)

Herndon silt loam, 6 to 10 percent slopes, eroded (HrC2).—This soil is on short side slopes in the uplands. Its surface layer is 4 to 6 inches thick. In many places it is a mixture of the remaining original surface soil and of material from the subsoil. In the less eroded areas, the surface layer is brown to yellowish-brown silt loam, but the color ranges to strong brown and the texture ranges to silty clay loam in the more eroded spots. The subsoil is 20 to 40 inches thick. It consists of yellowish-red to strong-brown, friable silty clay loam to silty clay that contains common red or yellow mottles.

Included with this soil in mapping were many areas where from 20 to 50 percent of the surface layer is covered with pebbles and cobblestones, and from 20 to 50 percent of the surface layer consists of pebbles and cobblestones. Also included were some severely eroded spots where the subsoil is exposed. These severely eroded spots occupy from 5 to 25 percent of the acreage in the mapping unit.

Infiltration is fair, and surface runoff is rapid. The hazard of further erosion is severe. This soil is difficult to keep in good tilth and can be worked within only a fairly narrow range of moisture content. A crust forms on the severely eroded spots after hard rains, and clods form if those areas are worked when wet. The crust and the clods interfere with germination. As a result, stands of crops are poor and replanting of the severely eroded areas may be necessary.

A large part of the acreage is in forest, but this soil is well suited to most of the locally grown crops. Where it has been cleared, it is used chiefly for row crops and pasture. Practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIIe–2, woodland suitability group 5, wildlife suitability group 1)

Herndon silt loam, 10 to 15 percent slopes, eroded (HrD2).—This soil is on narrow side slopes bordering upland drainageways. In most places it is moderately eroded, but it is only slightly eroded in some places. In the moderately eroded areas, the surface layer is brown or yellowish-brown silt loam to strong-brown silty clay loam. In the slightly eroded areas, the surface layer is very dark grayish-brown and brown to yellowish-brown silt loam. The surface layer is 3 to 6 inches thick. The subsoil is 20 to 36 inches thick and consists of yellowish-red to strong-brown, friable silty clay loam to silty clay that contains common mottles of red or yellow.

Included with this soil in mapping were areas where from 20 to 50 percent of the surface is covered with pebbles and cobblestones, and from 20 to 50 percent of the surface layer consists of pebbles and cobblestones. Also included were some severely eroded spots where the subsoil is exposed.

Infiltration is fair to good, and surface runoff is very rapid. The hazard of further erosion is very severe. Where this soil is only slightly eroded, it is fairly easy to keep in good tilth. Where it is moderately eroded, it is difficult to keep in good tilth and can be worked within only a fairly narrow range of moisture content. A crust forms on the severely eroded spots after hard rains, and clods form if those areas are worked when wet. The crust and the clods interfere with germination. As a result, stands of crops are poor and replanting of the severely eroded spots may be necessary.

A large part of the acreage is in forest, but this soil is well suited to most of the locally grown crops. Where it has been cleared, it is used chiefly for row crops. Practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IVe–2, woodland suitability group 5, wildlife suitability group 1)

Herndon silt loam, 15 to 25 percent slopes (HrE).—This soil is on narrow side slopes bordering major drainageways in the uplands. It is slightly eroded in some places and is moderately eroded in others. In the slightly eroded areas, the surface layer is very dark grayish-brown or brown to yellowish-brown silt loam 4 to 6 inches thick. In the moderately eroded areas, the surface layer is brown to yellowish-brown silt loam to strong-brown silty clay loam and is 3 to 7 inches thick. The subsoil is 20 to 30 inches thick. It consists of yellowish-red to strong-brown, friable silty clay loam to silty clay, with common mottles of red or yellow.

Included with this soil in mapping were many areas where from 20 to 50 percent of the surface is covered with pebbles and cobblestones, and areas where from 20 to 50 percent of the surface layer consists of pebbles and cobblestones. Also included were some severely eroded spots where the subsoil is exposed.

Infiltration is fair to good, and surface runoff is very rapid. This soil is highly susceptible to further erosion.

Practically all of the acreage is in forest, but areas of this soil that have been cleared are well suited to pasture and hay crops. This soil is not suited to crops that require cultivation. (Capability unit VIe-1, woodland suitability group 5, wildlife suitability group 1)

Lloyd Series

The Lloyd series consists of gently sloping to strongly sloping, deep, well-drained soils on Piedmont uplands in the western part of the county. The soils are on side slopes and on rounded divides that have a difference in elevation of about 30 feet between the highest and the lowest points. They have formed under forest in material that weathered from hornblende gneiss. The water table remains below the solum.

Natural fertility and the content of organic matter are low. The available water capacity is medium, and permeability and the shrink-swell potential are moderate. Except in areas where these soils have received lime, they are slightly acid to medium acid. Response is good if suitable applications of lime and fertilizer are made.

The Lloyd soils of Wake County are of only minor importance for farming. Much of the acreage is in forest.

Representative profile of a Lloyd loam 550 yards northeast of Bass Lake and 125 feet south of road:

Ap—0 to 9 inches, dark reddish-brown (2.5YR 4/4) loam; moderate, medium and fine, granular structure; very friable when moist; many fine and medium, woody and fibrous roots; many fine pores; few small quartz pebbles; medium acid; abrupt, wavy boundary.

B21t—9 to 12 inches, red (2.5YR 4/6) clay loam; moderate, medium and fine, subangular blocky structure; firm when moist, sticky and plastic when wet; common, fine, woody and fibrous roots; many fine pores; thin clay films; few small quartz pebbles; medium acid; clear, wavy boundary.

B22t—12 to 32 inches, red (10R 4/6) clay; moderate, fine, subangular blocky structure; firm when moist, sticky and plastic when wet; common, fine, woody roots; many fine pores; medium clay films; medium acid; clear, smooth boundary.

B23t—32 to 38 inches, dark-red (10R 3/6) clay loam; common, fine, distinct, red mottles; moderate, fine and medium, subangular blocky structure; firm when moist, sticky and plastic when wet; few, fine, woody roots; many fine pores; thick and medium clay films; medium acid; clear, smooth boundary.

B3t—38 to 44 inches, red (2.5YR 4/6) silty clay loam; many, fine, prominent, strong-brown mottles; moderate, fine and medium, subangular blocky structure; friable when moist, sticky and plastic when wet; many fine pores; thin, continuous clay films; medium acid; abrupt, smooth boundary.

C—44 to 50 inches +, mottled red and yellowish-red silty clay loam; massive; friable when moist; few thick clay films in vertical cracks; medium acid.

The A horizon ranges from 4 to 12 inches in thickness, and the B horizons range from 30 to 50 inches in combined thickness. The combined thickness of the A horizon and B horizons ranges from 36 to 60 inches. The texture of the B horizons ranges from clay to clay loam or silty clay loam. The color of the B2t horizons ranges from red to dark red in 2.5YR or 10R hues. In many places these soils are mottled with strong brown. Depth to hard rock ranges from 5 to more than 15 feet.

Lloyd soils occur with Cecil, Madison, and Georgeville soils. They have a darker red color in some parts of the subsoil than do those soils, and they have less silt throughout the profile than the Georgeville soils.

Lloyd loam, 2 to 6 percent slopes, eroded (LdB2).—This soil is on broad, smooth interstream divides in the uplands. The surface layer is 4 to 12 inches thick. In many places it is a mixture of the remaining original surface soil and of material from the subsoil. In the less eroded areas, the surface layer is reddish-brown loam, but the color ranges to dark reddish brown and the texture ranges to clay loam in the more eroded spots. The subsoil is red and dark-red, firm clay loam to clay that is 30 to 50 inches thick.

Included with this soil in mapping were some severely eroded spots, which occupy from 5 to 25 percent of the total acreage in the mapping unit. Also, in some places from 20 to 30 percent of the surface is covered with pebbles and cobblestones, and from 20 to 30 percent of the surface layer consists of pebbles and cobblestones.

Infiltration is fair, and surface runoff is medium. The hazard of further erosion is moderate. This soil is difficult to keep in good tilth and can be worked within only a fairly narrow range of moisture content without puddling. A crust forms on the severely eroded spots after hard rains, and clods form if those areas are worked when wet. The crust and the clods interfere with germination. As a result, stands of crops are poor and replanting of the severely eroded spots may be necessary.

About half of the acreage is cultivated or in pasture, and the rest is in forest. Where this soil has been cleared, it is used chiefly for row crops, but it is well suited to most of the locally grown crops. Practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIe-2, woodland suitability group 5, wildlife suitability group 1)

Lloyd loam, 6 to 10 percent slopes, eroded (LdC2).—This soil is on narrow side slopes in the uplands. Its surface layer is 4 to 10 inches thick. In many places it is a mixture of the remaining original surface soil and of material from the subsoil. In the less eroded areas, the surface layer is reddish-brown loam, but the color ranges to dark reddish brown and the texture ranges to clay loam in the more eroded spots. The subsoil is 30 to 42 inches thick and consists of red and dark-red, firm clay loam to clay.

Included with this soil in mapping were some severely

eroded spots that occupy from 5 to 25 percent of the acreage in the mapping unit. Also, in some places from 20 to 30 percent of the surface is covered with pebbles and cobblestones, and from 20 to 30 percent of the surface layer consists of pebbles and cobblestones.

Infiltration is fair, and surface runoff is rapid. The hazard of further erosion is severe. This soil is difficult to keep in good tilth and can be worked within only a fairly narrow range of moisture content without puddling. A crust forms on the severely eroded spots after hard rains, and clods form if those areas are worked when wet. The crust and the clods interfere with germination. As a result, stands of crops are poor and replanting of the severely eroded areas may be necessary.

Most of the acreage is in forest, but this soil is well suited to most of the locally grown crops. Where it has been cleared, it is used chiefly for row crops. Practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIIe–2, woodland suitability group 5, wildlife suitability group 1)

Lloyd loam, 10 to 15 percent slopes, eroded (LdD2).—This soil is on narrow side slopes bordering drainageways. Its surface layer is 4 to 8 inches thick. In many places it is a mixture of the remaining original surface soil and of material from the subsoil. In the less eroded areas, the surface layer is reddish-brown loam, but the color ranges to dark reddish brown and the texture ranges to clay loam in the more eroded spots. The subsoil is red and dark-red, firm clay loam to clay that is 30 to 36 inches thick.

Included with this soil in mapping were some severely eroded spots that occupy from 5 to 25 percent of the total acreage in the mapping unit. Also, in some places from 20 to 30 percent of the surface is covered with pebbles and cobblestones, and from 20 to 30 percent of the surface layer consists of pebbles and cobblestones.

Infiltration is fair, and surface runoff is very rapid. The hazard of further erosion is severe. This soil is difficult to keep in good tilth and can be worked within only a fairly narrow range of moisture content without puddling. A crust forms on the severely eroded spots after hard rains, and clods form if those areas are worked when wet. The crust and the clods interfere with germination. As a result, stands of crops are poor and replanting of the severely eroded spots may be necessary.

Most of the acreage is in forest, but this soil is well suited to most of the locally grown crops. Where it has been cleared, it is used chiefly for row crops. Practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IVe–2, woodland suitability group 5, wildlife suitability group 1)

Louisburg Series

The Louisburg series consists of gently sloping to strongly sloping, moderately deep, somewhat excessively drained soils on Piedmont uplands. These soils occupy large areas in the northern and eastern parts of the county and small areas in other parts. They are on side slopes and on rounded divides that have a difference in elevation of about 30 feet between the highest and the lowest points. The soils have formed under forest in material that weathered from granite, gneiss, schist, and other acidic rocks. The water table remains beneath the solum.

Natural fertility and the content of organic matter are low. Permeability is moderately rapid, and the available water capacity and the shrink-swell potential are low. Except in areas that have received lime, these soils are strongly acid. Response is fairly good if suitable applications of fertilizer and lime are made.

The Louisburg soils in this county are fairly important for farming, but much of the acreage is in forest.

Representative profile of a Louisburg loamy sand in a cultivated field three-fourths of a mile south of Hodges Creek and 30 yards east of county road No. 2217:

Ap—0 to 8 inches, dark grayish-brown (10YR 4/2) loamy sand, weak, medium, granular structure; very friable; many fine, fibrous roots; common coarse fragments of feldspar; strongly acid; abrupt, smooth boundary.

B—8 to 12 inches, yellowish-brown (10YR 5/4) sandy loam; structureless; very friable; few, fine, fibrous roots; common coarse particles of feldspar; strongly acid; clear, smooth boundary.

C—12 to 36 inches, brownish-yellow (10YR 6/6) loamy sand; structureless; very friable to loose; strongly acid; abrupt boundary.

R—36 inches +, hard granitic gneiss.

The Ap horizon ranges from 4 to 10 inches in thickness and from very dark grayish brown or dark grayish brown to light yellowish brown in color. The B horizon ranges from 4 to 35 inches in thickness. Its color ranges from light yellowish brown to yellowish brown or yellowish red in hues of 2.5Y to 5YR. In places the profile contains a discontinuous lower B horizon that ranges from 2 to 6 inches in thickness and from sandy clay loam to sandy clay in texture. The texture of the C horizon is commonly loamy sand, but it ranges to sandy clay loam in some areas. The combined thickness of the Ap horizon and B horizons ranges from 20 to 50 inches. In general, depth to hard rock is 2 to 4 feet, but outcrops of rock are common in most of these soils.

Louisburg soils occur with Wedowee, Wake, and Wilkes soils. Their subsoil is coarser textured than that of the Wedowee soils, and their solum is thicker than that of the Wake soils. They are more acid and generally have a coarser textured subsoil than the Wilkes soils.

Louisburg loamy sand, 2 to 6 percent slopes (LoB).—This soil is on small ridges in the uplands. Its surface layer is very dark grayish-brown to light yellowish-brown loamy sand 4 to 10 inches thick. The subsoil is light yellowish-brown to yellowish-red, very friable sandy loam 4 to 35 inches thick. Included with this soil in mapping were some areas in which from 20 to 50 percent of the surface is covered with pebbles and cobblestones, and from 20 to 50 percent of the surface layer consists of pebbles and cobblestones.

Infiltration is good, and surface runoff is medium. The hazard of erosion is severe. This soil is easy to keep in good tilth and can be worked throughout a wide range of moisture content.

About two-thirds of the acreage is in forest, and the rest is cultivated or in pasture. Where this soil has been cleared, it is used chiefly for row crops, but it is fairly well suited to many of the locally grown crops. Because of the slopes and shallowness over bedrock, intensive practices that effectively control runoff and erosion are needed in the cultivated areas. During rainy seasons, its coarse texture makes this soil subject to leaching of mobile plant nutrients. (Capability unit IIIe–4, wood-

land suitability group 12, wildlife suitability group 4)

Louisburg loamy sand, 6 to 10 percent slopes (LoC).—This soil is on side slopes in the uplands. Its surface layer is very dark grayish-brown to light yellowish-brown loamy sand 4 to 8 inches thick. The subsoil is light yellowish-brown to yellowish-red, very friable sandy loam 4 to 30 inches thick. Included in mapping were some areas in which from 20 to 50 percent of the surface is covered with pebbles and cobblestones, and from 20 to 50 percent of the surface layer consists of pebbles and cobblestones.

Infiltration is good, and surface runoff is rapid. The hazard of erosion is very severe. This soil is easy to keep in good tilth and can be worked throughout a wide range of moisture content.

Most of the acreage is in forest, but this soil is fairly well suited to many of the locally grown crops. Where it has been cleared, it is used chiefly for row crops. Intensive practices that effectively control runoff and erosion are needed in the cultivated areas. During rainy seasons, its coarse texture makes this soil subject to leaching of mobile plant nutrients. (Capability unit IVe–3, woodland suitability group 12, wildlife suitability group 4)

Louisburg loamy sand, 10 to 15 percent slopes (LoD).—This soil is on side slopes bordering drainageways in the uplands. Its surface layer is very dark grayish-brown to light yellowish-brown loamy sand 4 to 6 inches thick. The subsoil is light yellowish-brown to yellowish-red, very friable sandy loam that is 4 to 24 inches thick. Included in mapping were some areas in which from 20 to 50 percent of the surface is covered with pebbles and cobblestones, and from 20 to 50 percent of the surface layer consists of pebbles and cobblestones.

Infiltration is good, and surface runoff is very rapid. This soil is highly susceptible to further erosion.

This soil is not suitable for cultivation, and practically all of the acreage is in forest. Areas that have been cleared should be used for pasture or hay crops. (Capability unit VIe–1, woodland suitability group 12, wildlife suitability group 4)

Louisburg-Wedowee complex, 2 to 6 percent slopes (LwB).—Soils of this mapping unit are so intricately mixed that they cannot be separated on a map of the scale used. Also, the areas of each soil are generally too small to be managed as an individual unit. Therefore, these soils were mapped together as a soil complex. In a typical mapped area, about 60 percent of the acreage is Louisburg soil, 38 percent is Wedowee soil, and 2 percent is Durham, Vance, and other soils. The soils are on small ridges in the northeastern part of the county.

The Louisburg soil has a very dark grayish-brown to light yellowish-brown surface layer of loamy sand 5 to 8 inches thick. The subsoil is light yellowish-brown to yellowish-red, very friable to loose sandy loam 15 to 35 inches thick.

The Wedowee soil has a dark grayish-brown to light yellowish-brown surface layer of sandy loam that grades to loamy sand and is 5 to 8 inches thick. The subsoil is yellowish-brown to yellowish-red, firm sandy clay loam 9 to 20 inches thick.

Included with these soils in mapping were some areas in which 20 to 50 percent of the surface is covered with pebbles and cobblestones. In those areas from 20 to 50 percent of the surface layer consists of pebbles and cobblestones.

Infiltration is good, and surface runoff is medium. The hazard of erosion is severe. These soils are easy to keep in good tilth and can be worked throughout a wide range of moisture content.

Most of the acreage is in forest, but these soils are fairly well suited to many of the locally grown crops. Intensive practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIIe–4, woodland suitability group 12, wildlife suitability group 4)

Louisburg-Wedowee complex, 2 to 6 percent slopes, eroded (LwB2).—The soils of this complex are on rather small ridges in the northeastern part of the county. In a typical mapped area, about 60 percent of the acreage is Louisburg soil, 38 percent is Wedowee soil, and 2 percent is Durham, Vance, and other soils.

The Louisburg soil of this complex has a grayish-brown to light yellowish-brown surface layer of loamy sand 4 to 8 inches thick. Its subsoil is light yellowish-brown to yellowish-red, very friable to loose sandy loam 15 to 35 inches thick.

The Wedowee soil has a surface layer 3 to 7 inches thick. In many places its surface layer is a mixture of the remaining original surface soil and of material from the subsoil. In the less eroded areas, the surface layer is grayish-brown to pale-brown sandy loam. The color ranges to strong brown and the texture ranges to sandy clay loam, however, in severely eroded spots, and those areas make up from 5 to 10 percent of the total acreage in the mapping unit. The subsoil is yellowish-brown to yellowish-red, firm sandy clay loam 9 to 20 inches thick.

Included with these soils in mapping were some areas in which from 20 to 50 percent of the surface is covered with pebbles and cobblestones. In those areas from 20 to 50 percent of the surface layer consists of pebbles and cobblestones.

In the Louisburg soil, infiltration is good. In the Wedowee soil, it is only fair. Surface runoff is medium, and the hazard of further erosion is severe. The Louisburg soil is easy to keep in good tilth and can be worked throughout a wide range of moisture content. The Wedowee soil is difficult to keep in good tilth, but it can be worked throughout a fairly wide range of moisture content.

Most of the acreage is in forest, but these soils are fairly well suited to many of the locally grown crops. Intensive practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIIe–4, woodland suitability group 12, wildlife suitability group 4)

Louisburg-Wedowee complex, 6 to 10 percent slopes (LwC).—The soils of this complex are on side slopes of medium length in uplands in the northeastern part of the county. In a typical mapped area, about 60 percent of the acreage is Louisburg soil, 38 percent is Wedowee soil, and 2 percent is Durham, Vance, and other soils.

The Louisburg soil has a dark grayish-brown to light yellowish-brown surface layer of loamy sand 4 to 6 inches thick. Its subsoil is light yellowish-brown to yellowish-red, very friable to loose sandy loam 15 to 30 inches thick.

The Wedowee soil has a dark grayish-brown to light yellowish-brown surface layer of sandy loam that is 4 to 6 inches thick and grades to loamy sand. Its subsoil is yellowish-brown to yellowish-red, firm sandy clay loam 9 to 15 inches thick.

Included with these soils in mapping were some areas in which from 20 to 50 percent of the surface is covered with pebbles and cobblestones. In those areas from 20 to 50 percent of the surface layer consists of pebbles and cobblestones.

Infiltration is good, and surface runoff is rapid. The hazard of erosion is very severe. These soils are easy to keep in good tilth and can be worked throughout a wide range of moisture content.

Most of the acreage is in forest, but these soils are fairly well suited to many of the locally grown crops. If cultivated crops are grown, intensive practices that effectively control runoff and erosion are needed. (Capability unit IVe-3, woodland suitability group 12, wildlife suitability group 4)

Louisburg-Wedowee complex, 6 to 10 percent slopes, eroded (LwC2).—These soils are on side slopes of medium length in uplands in the northeastern part of the county. In a typical mapped area, about 60 percent of the acreage is Louisburg soil, 38 percent is Wedowee soil, and 2 percent is Durham, Vance, and other soils.

The Louisburg soil has a grayish-brown to light yellowish-brown surface layer of loamy sand 4 to 6 inches thick. The subsoil is light yellowish-brown to yellowish-red, very friable to loose sandy loam 15 to 30 inches thick.

The Wedowee soil has a surface layer that is 3 to 7 inches thick. In many places its surface layer is a mixture of the remaining original surface soil and of material from the subsoil. In the slightly eroded or moderately eroded areas, the surface layer is grayish-brown to pale-brown sandy loam. The color grades to strong brown and the texture ranges to sandy clay loam in the severely eroded spots. The severely eroded spots make up from 5 to 10 percent of the acreage in the mapping unit. The subsoil is yellowish-brown to yellowish-red, firm sandy clay loam 9 to 15 inches thick.

Included with these soils in mapping were some areas in which from 20 to 50 percent of the surface is covered with pebbles and cobblestones. In those areas from 20 to 50 percent of the surface layer consists of pebbles and cobblestones.

For the Louisburg soil, infiltration is good and surface runoff is medium. For the Wedowee soil, infiltration is fair and surface runoff is rapid. For both soils, the hazard of further erosion is very severe. The Louisburg soil is easy to keep in good tilth and can be worked throughout a wide range of moisture content. The Wedowee soil is difficult to keep in good tilth, but it can be worked throughout a fairly wide range of moisture content.

Most of the acreage is in forest. Because of the slope and bedrock near the surface in many places, intensive practices that effectively control runoff and erosion are needed if these soils are cultivated. (Capability unit IVe-3, woodland suitability group 12, wildlife suitability group 4)

335-403—70——4

Lynchburg Series

The Lynchburg series consists of soils that are nearly level, very deep, and somewhat poorly drained. These soils are in upland depressions of the Coastal Plain in the southern part of the county. They have formed under forest in Coastal Plain sediment. A seasonally high water table is at a depth of about 1½ feet.

Natural fertility and the content of organic matter are low, permeability is moderate, and the available water capacity is medium. The shrink-swell potential is low. Except in areas that have received lime, these soils are strongly acid. Response is good if suitable applications of lime and fertilizer are made.

Most areas of Lynchburg soils are cultivated or in pasture. Because of their limited acreage in Wake County, however, these soils are not important for farming.

Representative profile of Lynchburg sandy loam in a cultivated field 0.5 mile west of Fuquay Springs on N.C. Highway No. 42, 0.75 mile north on a paved road, 100 yards west on a farm road, and 200 yards south of farm road:

Ap—0 to 8 inches, grayish-brown (10YR 5/2) sandy loam; weak, medium, granular structure; very friable when moist; many fine and medium, fibrous roots; common fine pores; medium acid; abrupt, irregular boundary.

A2—8 to 13 inches, light yellowish-brown (2.5Y 6/4) sandy loam; weak, medium, granular structure; very friable when moist; few, fine, fibrous roots; many fine pores; medium acid; abrupt, wavy boundary.

B1—13 to 16 inches, olive-yellow (2.5Y 6/6) sandy clay loam; few, medium, distinct, brownish-yellow mottles; weak, fine and medium, subangular blocky structure; friable when moist, sticky and plastic when wet; few, fine, fibrous roots; many fine pores; strongly acid; abrupt, wavy boundary.

B21t—16 to 20 inches, light yellowish-brown (2.5Y 6/4) sandy clay loam; many, medium, distinct, yellowish-brown mottles; moderate, fine and medium, subangular blocky structure; friable when moist, sticky and plastic when wet; common fine pores; few thin clay films; strongly acid; gradual, smooth boundary.

B22t—20 to 26 inches, light brownish-gray (2.5Y 6/2) sandy clay loam; common, medium, distinct, yellowish-brown mottles and few, medium, prominent, yellowish-red mottles; moderate, fine and medium, subangular blocky structure; friable when moist, sticky and plastic when wet; many fine pores; few thin clay films on ped surfaces; strongly acid; gradual, smooth boundary.

B23tg—26 to 31 inches, light brownish-gray (10YR 6/2) sandy clay loam; many, coarse, distinct, yellowish-brown (10YR 5/8) mottles; weak, fine and medium, subangular blocky structure; friable when moist, sticky and plastic when wet; common fine pores; thin clay films on ped surfaces; strongly acid; gradual, smooth boundary.

B24tg—31 to 37 inches, mottled light brownish-gray (2.5Y 6/2) and yellowish-brown (10YR 5/8) sandy clay loam; weak, medium and coarse, subangular blocky structure; friable when moist, sticky and plastic when wet; common fine pores; few thin clay films; strongly acid; abrupt, smooth boundary.

B3g—37 to 65 inches, coarsely mottled light brownish-gray (2.5Y 6/2), red (2.5YR 4/8), and brownish-yellow (10YR 6/8) heavy sandy loam; weak, coarse, subangular blocky structure; very friable when moist, slightly sticky and slightly plastic when wet; strongly acid; clear, smooth boundary.

C—65 to 72 inches +, mottled gray, yellowish-brown, and red clay; massive; firm when moist; strongly acid.

The A horizons range from 8 to 20 inches in combined thickness and from dark brown or dark grayish brown to light yellowish brown or light gray in color. The Bt horizons range from 21 to 60 inches in combined thickness. Their texture is mostly sandy loam or sandy clay loam that is 18 to 35 percent clay. In places these horizons contain pockets and lenses of sand. The color of the Bt horizons ranges from yellowish brown to pale yellow or light brownish gray in 10YR or more yellowish hues. In places few to common gray mottles are within 10 inches of the top of the uppermost Bt horizon. The B3g horizon is pale brown to light brownish gray or brownish yellow and generally contains distinct, grayish mottles. The combined thickness of the A horizons and B horizons is more than 60 inches. Depth to bedrock is more than 20 feet.

Lynchburg soils occur with Goldsboro and Rains soils, and their texture is similar to the texture of those soils. They are less well drained than the Goldsboro soils, however, and are better drained than the Rains.

Lynchburg sandy loam (0 to 2 percent slopes) (Ly).—This is the only Lynchburg soil mapped in Wake County. It is in depressions in uplands of the Coastal Plain. The surface layer is dark-brown or light-gray to very dark gray sandy loam 8 to 20 inches thick. The subsoil is 30 to 60 inches thick and is pale-yellow to yellowish-brown, friable sandy loam to sandy clay loam mottled with shades of gray.

Infiltration is good, and surface runoff is slow. This soil is easy to keep in good tilth and can be worked throughout a wide range of moisture content.

Drainage is required for most row crops to do well on this soil. If proper drainage is provided, this soil is well suited to most of the locally grown crops. It is used mainly for row crops or pasture. (Capability unit IIw-1, woodland suitability group 4, wildlife suitability group 2)

Made land (Ma) is a miscellaneous land type in which the areas have been altered by man to the extent that the profile of the original soils cannot be recognized. The altered soil material does not function as did the original soil, and in many places it does not resemble the original soil.

Some areas of Made land were made when cutting and filling was done to construct parking lots, airfields, industrial sites, and highway interchanges. In many places all or part of the solum and part of the material underlying the original soils was cut from one area and was moved to another spot for use as fill material. Other areas of Made land are near quarries where the overburden has been dumped into large mounds. In those places gravel has been spread and packed into the soils until the soil material is compacted and hard.

The areas included in this land type are so diverse in characteristics that general statements cannot be made about them. Onsite examination of each area is necessary before any land use is planned. (Not placed in a capability unit; woodland suitability group 13, wildlife suitability group 5)

Madison Series

The Madison series consists of gently sloping to moderately steep, deep, well-drained soils that occupy fairly small areas on Piedmont uplands in the northern part of the county. These soils are on side slopes and on rounded divides where the difference in elevation is about 60 feet between the highest and the lowest points. They have formed under forest in material that weathered from mica schist, mica gneiss, and other acidic rocks.

Natural fertility and the content of organic matter are low, permeability is moderate, and the available water capacity is medium. The shrink-swell potential is moderate. Except in areas that have received lime, these soils are strongly acid. Response is good if suitable applications of lime and fertilizer are made.

The Madison soils of Wake County are not important for farming. They are mostly in forest.

Representative profile of a Madison sandy loam in a wooded area 1¾ miles west of the Neuse River Bridge on N.C. Highway No. 98 and 10 yards south of road:

Ap—0 to 6 inches, brown (10YR 5/3) sandy loam; weak, medium, granular structure; very friable when moist; many fine, woody and fibrous roots; common fine mica flakes; few small quartz and quartz mica schist pebbles; medium acid; abrupt, wavy boundary.

B1—6 to 12 inches, red (2.5YR 4/6) heavy sandy clay loam; weak, medium, subangular blocky structure; friable when moist, slightly sticky and slightly plastic when wet; common, fine, woody and fibrous roots; common fine mica flakes; strongly acid; abrupt, wavy boundary.

B2t—12 to 26 inches, red (2.5YR 4/6) clay loam; moderate, medium, subangular blocky structure; friable when moist, slightly sticky and slightly plastic when wet; thin clay films; common, fine, woody and fibrous roots; many fine mica flakes; few partly disintegrated schist fragments; strongly acid; abrupt, wavy boundary.

B3t—26 to 32 inches, red (2.5YR 4/6) sandy clay loam; moderate, medium, subangular blocky structure; friable when moist, slightly sticky and slightly plastic when wet; few thin clay films; few, small, woody roots; many fine mica flakes; common schist fragments, and pale-yellow and dusky-red mottles around the fragments; strongly acid; clear, wavy boundary.

C—32 to 48 inches +, mottled dusky-red, red, pale-yellow, strong-brown, and brown silt loam disintegrated quartz mica schist; common dark flakes that appear to be disintegrated garnet; few, small, woody roots extending to a depth of more than 48 inches; strongly acid.

The Ap horizon ranges from 3 to 10 inches in thickness and from dark brown to brown in color. The B horizons range from 10 to 35 inches in combined thickness and from sandy clay loam to clay in texture. The B1 horizon is yellowish red to red. The modal color of the Bt horizons is red of 2.5YR hue, but the color of those horizons ranges to dark red. The number of mica flakes ranges from few to common in the A horizon and from common to many in the B1 horizon, but the B2t horizon, and, in places, the C horizon, contain many mica flakes. The combined thickness of the Ap horizon and B horizons, ranges from 20 to 40 inches, and, in places, the thickness varies greatly within a short lateral distance. Depth to hard rock ranges from 5 to more than 15 feet.

Madison soils occur with the Cecil, Georgeville, and Lloyd soils, but they have a thinner solum and contain more mica flakes than those soils. The Madison soils contain less silt than the Georgeville soils and are more acid than the Lloyd soils.

Madison sandy loam, 2 to 6 percent slopes, eroded (MdB2).—This soil is on smooth interstream divides. Its surface layer is 3 to 10 inches thick. In many places it is a mixture of the remaining original surface soil and of material from the subsoil. In the less eroded areas, the surface layer is dark brown to brown, but the color is

redder and the texture ranges to clay loam in the more eroded spots. The subsoil is red to dark-red, friable clay to clay loam and is 10 to 28 inches thick.

Included with this soil in mapping were some severely eroded spots where the subsoil is exposed. These spots make up from 5 to 25 percent of the acreage in the mapping unit.

Infiltration is fair, and surface runoff is medium. The hazard of further erosion is moderate. This soil is difficult to keep in good tilth, but it can be worked throughout a fairly wide range of moisture content. A crust forms on the severely eroded spots after hard rains, and clods form if those areas are worked when wet. The crust and the clods interfere with germination. As a result, stands of crops are poor and replanting of the severely eroded spots may be necessary.

About half of the acreage is cultivated or in pasture, and the rest is in forest. Where this soil has been cleared, it is used chiefly for row crops and pasture, but it is well suited to all the locally grown crops. Practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIe-1, woodland suitability group 5, wildlife suitability group 1)

Madison sandy loam, 6 to 10 percent slopes, eroded (MdC2).—This soil is on short to long side slopes in the uplands. Its surface layer is 3 to 7 inches thick. In many places the surface layer is a mixture of the remaining original surface soil and of material from the subsoil. In the less eroded spots the surface layer is dark-brown to brown sandy loam, but the texture ranges to clay loam that has a reddish color in the more eroded spots. The subsoil is red to dark-red, friable clay loam to clay, and it is 10 to 30 inches thick.

Included with this soil in mapping were some severely eroded areas where the subsoil is exposed. These areas make up from 5 to 25 percent of the acreage in the mapping unit.

Infiltration is fair, and surface runoff is rapid. The hazard of further erosion is severe. This soil is difficult to keep in good tilth, but it can be worked throughout a fairly wide range of moisture content. A crust forms on the severely eroded spots after hard rains, however, and clods form if those areas are worked when wet. The crust and the clods interfere with germination. As a result, stands of crops are poor and replanting of those areas may be necessary.

About three-fourths of the acreage is in forest, and the rest is used chiefly for row crops and pasture. This soil is well suited to all the locally grown crops. Practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIIe-1, woodland suitability group 5, wildlife suitability group 1)

Madison sandy loam, 10 to 15 percent slopes, eroded (MdD2).—This soil is on narrow side slopes bordering upland drainageways. The surface layer is 3 to 7 inches thick. In many places it is a mixture of the remaining original surface soil and of material from the subsoil. In the less eroded areas, the surface layer is dark-brown to brown sandy loam, but in the more eroded spots the texture ranges to clay loam that has a reddish color. The subsoil is red to dark-red, friable clay loam to clay that is 10 to 35 inches thick.

Included with this soil in mapping were some severely eroded spots where the subsoil is exposed. These eroded areas make up from about 5 to 25 percent of the acreage in the mapping unit.

Infiltration is fair, and surface runoff is very rapid. The hazard of further erosion is very severe. This soil is difficult to keep in good tilth, but it can be worked throughout a fairly wide range of moisture content. A crust forms on the severely eroded spots after hard rains, and clods form if those areas are worked when wet. The crust and the clods interfere with germination. As a result, stands of crops are poor and replanting of the severely eroded areas may be necessary.

Practically all of the acreage is in forest, but a small acreage is in pasture or cultivated crops, mainly row crops. This soil is well suited to all the locally grown crops, but very intensive practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IVe-1, woodland suitability group 5, wildlife suitability group 1)

Madison sandy loam, 15 to 25 percent slopes, eroded (MdE2).—This soil is on narrow side slopes bordering major upland drainageways. Its surface layer is 3 to 5 inches thick. In many places the surface layer is a mixture of the remaining original surface soil and of material from the subsoil. In the less eroded areas, the surface layer is dark-brown to brown sandy loam, but the texture ranges to clay loam that has a reddish color in some of the more eroded spots. The subsoil is red to dark-red, friable clay loam to clay that is 10 to 24 inches thick.

Included with this soil in mapping were some severely eroded spots where the subsoil is exposed. These areas make up from 5 to 25 percent of the acreage in the mapping unit.

Infiltration is fair, and surface runoff is very rapid. This soil is highly susceptible to further erosion.

Practically all of the acreage is in forest. Where this soil has been cleared, however, it is suited to permanent hay or pasture. It is not suited to cultivated crops. Capability unit VIe-1, woodland suitability group 5, wildlife suitability group 1)

Mantachie Series

The Mantachie series consists of nearly level or gently sloping, deep, somewhat poorly drained soils in depressions of the Piedmont and Coastal Plain uplands. These soils have formed in coarse loamy deposits of local alluvium washed from surrounding soils of the uplands. A seasonally high water table is at a depth of about 2 feet.

Natural fertility and the content of organic matter are low, and permeability is moderate to moderately rapid. The available water capacity is medium, and the shrink-swell potential is low. These soils are frequently flooded, but the floodwaters remain for only a brief period of time. Except in areas that have received lime, the soils are medium acid. Response is fairly good if suitable applications of lime and fertilizer are made.

In Wake County Mantachie soils are not important for farming. The areas are generally too small to be managed as a field independent of the surrounding soils, and most of the acreage is in forest. Where these soils have been

Figure 6.—**Grassed waterway through an area of Mantachie soils.**

cleared, they are used mostly for pasture or waterways (fig. 6).

Representative profile of a Mantachie sandy loam in a draw in a wooded area 1.3 miles southeast of U.S. Highway No. 64 on county road No. 2337, 1,000 feet northeast on a farm road, and 100 feet west of the farm road:

Ap—0 to 10 inches, dark grayish-brown (10YR 4/2) sandy loam; weak, medium, granular structure; very friable when moist; many fine and medium, woody roots; many fine pores; slightly acid; gradual, wavy boundary.

B21—10 to 20 inches, dark yellowish-brown (10YR 4/4) sandy loam; common, medium, distinct mottles of grayish brown; weak, medium, granular structure; friable when moist; common fine and medium roots; common fine pores; medium acid; gradual, wavy boundary.

B22g—20 to 29 inches, gray (N 5/0) sandy loam; common, medium, distinct mottles of pale brown; structureless; very friable when moist; common, fine, woody roots; medium acid; gradual, wavy boundary.

C1g—29 to 35 inches, gray (10YR 5/1) loamy sand; common, medium, distinct, brown mottles; structureless; very friable to loose when moist; common, fine, woody roots; medium acid; gradual, wavy boundary.

C2g—35 to 45 inches +, gray (10YR 5/1) sandy loam; common, medium, distinct mottles of pale brown; structureless.

The A horizon ranges from 4 to 20 inches in thickness, from dark brown or gray to dark grayish brown in color, and from sandy loam to silt loam in texture. The B horizons range from 10 to more than 40 inches in combined thickness, and those horizons are variable in color and texture. The colors range from gray or very pale brown to dark brown or dark yellowish brown mottled with gray. The texture ranges from sandy loam to light loam. The structure ranges from subangular blocky or granular to single grain and massive. The consistence is friable to loose. The profile of the Mantachie soils is more than 40 inches thick. Depth to hard rock ranges from 5 to 15 feet or more.

Mantachie soils occur with Bibb, Chewacla, and Wehadkee soils. They are better drained than the Bibb and Wehadkee soils and are coarser textured than the Chewacla and Wehadkee soils.

Mantachie soils (0 to 4 percent slopes) (Me).—These soils are in depressions and draws in the uplands. Their surface layer is dark-brown or gray to dark grayish-brown sandy loam to silt loam 4 to 20 inches thick. The subsoil is 10 to 40 inches thick and ranges from gray or very pale brown to dark brown in color and from sandy loam to loam in texture. It contains common gray mottles.

Infiltration is good, and surface runoff is slow to medium. Flooding is frequent but of short duration. These soils are easy to keep in good tilth, and they can be worked throughout a wide range of moisture content.

If suitable drainage is provided, these soils are well suited to most of the locally grown crops, but most of the acreage is in forest. Where the soils have been cleared, they are used chiefly for pasture or as sod waterways. (Capability unit IIIw-2, woodland suitability group 4, wildlife suitability group 2)

Mayodan Series

The Mayodan series consists of gently sloping to moderately steep, well-drained soils that are deep or moderately deep over hard rock. These soils are on rounded divides that have a difference in elevation of about 50 feet between the highest and the lowest points. They occupy large areas in the western part of the county, where they have formed under forest. The material in which they formed has weathered from sandstone, mudstone, and shale of Triassic age. The water table remains below the solum.

Natural fertility and the content of organic matter are low. The available water capacity is medium, and permeability and the shrink-swell potential are moderate. Except in areas that have received lime, these soils are strongly acid. Response is good if suitable applications of lime and fertilizer are made.

Mayodan soils are not important for farming. In this county most of the acreage is in forest.

Representative profile of a Mayodan sandy loam in a cultivated field 1⅓ miles southwest of the Apex Junior High School and 100 yards south of road:

Ap—0 to 7 inches, grayish-brown (10YR 5/2) sandy loam; weak, medium, granular structure; very friable when moist; many fine, fibrous roots; few small quartz pebbles; medium acid; abrupt, smooth boundary.

B21t—7 to 11 inches, yellowish-red (5YR 5/6) clay loam; strong, fine and medium, subangular blocky structure; firm to friable when moist, sticky and plastic when wet; thin, continuous clay films; strongly acid; clear, wavy boundary.

B22t—11 to 18 inches, yellowish-red (5YR 5/8) clay; common, coarse, distinct, strong-brown (7.5YR 5/8) mottles; strong, fine and medium, subangular blocky structure; firm when moist, sticky and plastic when wet; thin clay films; strongly acid; clear, smooth boundary.

B23t—18 to 25 inches, yellowish-red (5YR 4/8) clay; many, coarse, distinct, strong-brown (7.5YR 5/8) mottles; strong, medium and coarse, subangular blocky structure; firm when moist, sticky and plastic when wet; thin, continuous clay films; strongly acid; clear, smooth boundary.

B3—25 to 40 inches, mottled red, strong-brown, and yellow sandy clay loam; moderate, fine and medium, angular blocky structure to massive; friable when moist, slightly sticky and slightly plastic when wet; medium, discontinuous clay films on vertical surfaces; strongly acid; clear, smooth boundary.

C—40 to 48 inches, mottled red, yellow, strong-brown, and light-gray sandy loam from disintegrated sandstone of Triassic age; strongly acid.

Where the solum is only 18 to 30 inches thick, a thin phase of the Mayodan series is recognized. Following is a representative profile of a thin phase of Mayodan silt loam in a wooded area one-half mile west of Morrisville and 20 yards north of county road No. 1002:

O1—2 inches to 0, undecomposed forest litter.
A1—0 to 1 inch, dark grayish-brown (10YR 4/2) silt loam; weak, medium, granular structure; very friable when moist; many fine, woody and fibrous roots; medium acid; abrupt, smooth boundary.
A2—1 to 4 inches, yellow (10YR 7/6) silt loam; weak, medium, granular structure; very friable when moist; common, fine, woody and fibrous roots; strongly acid; clear, smooth boundary.
B1—4 to 9 inches, reddish-yellow (7.5YR 6/6) heavy silt loam; weak, medium, subangular blocky structure; friable when moist, slightly sticky and slightly plastic when wet; common, fine, woody roots; strongly acid; clear, smooth boundary.
B21t—9 to 15 inches, yellowish-red (5YR 5/8) silty clay loam; common, medium, distinct, reddish-yellow mottles; moderate, medium, subangular blocky structure; friable when moist, sticky and plastic when wet; very few thin clay films; few, fine, woody roots; strongly acid; clear, smooth boundary.
B22t—15 to 20 inches, yellowish-red (5YR 5/6) silty clay loam; few, fine, prominent, red mottles; moderate, medium, subangular blocky structure; friable when moist, sticky and plastic when wet; common thin clay films; strongly acid; abrupt, smooth boundary.
B3t—20 to 24 inches, yellowish-red (5YR 5/6) silty clay loam; common, medium, prominent, red mottles; moderate, medium, subangular blocky structure; friable when moist, sticky and plastic when wet; few clay films in vertical cracks; common small fragments of shale; strongly acid; abrupt, broken boundary.
C—24 to 36 inches, red (2.5YR 4/8) silt loam from disintegrated shale.
R—36 inches +, red, hard shale.

The A horizon ranges from 3 to 15 inches in thickness, from dark grayish brown or grayish brown to light yellowish brown or strong brown in color, and from sandy loam or gravelly sandy loam to sandy clay loam in texture. The Bt horizons range from 15 to 50 inches in combined thickness and from clay loam or silty clay loam to clay in texture. The color of the Bt horizons ranges from yellowish red to strong brown in 5YR to 7.5YR hues. Many of those horizons have common mottles of brown and red. Typically, from 5 to 30 percent of the soil material throughout the profile consists of rounded and angular pebbles. Mayodan soils have a high content of exchangeable aluminum. The combined thickness of the A horizon and B horizons ranges from 20 to 50 inches. Depth to hard rock ranges from 3 to more than 15 feet.

Mayodan soils occur with Granville, Creedmoor, and Appling soils. They are redder than the Granville soils, lack the very firm or plastic lower subsoil of the Creedmoor soils, and contain more exchangeable aluminum than the Appling soils.

Mayodan sandy loam, 2 to 6 percent slopes (MfB).—This soil is on broad, smooth interstream divides in the uplands. Its surface layer is grayish-brown to yellowish-brown sandy loam 7 to 15 inches thick. The subsoil is yellowish-red to strong-brown, firm clay loam to clay that has common mottles of red and brown and is 26 to 50 inches thick. Included in mapping were a few places in which the slope is less than 2 percent.

Infiltration is good, and surface runoff is medium. The hazard of erosion is moderate. This soil is easy to keep in good tilth and can be worked throughout a wide range of moisture content.

About two-thirds of the acreage is cultivated or in pasture, and the rest is in forest or in other uses. The cultivated areas are used chiefly for tobacco and cotton and to a lesser extent for other row crops, but this soil is well suited to all the locally grown crops. Practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIe-1, woodland suitability group 5, wildlife suitability group 1)

Mayodan sandy loam, 2 to 6 percent slopes, eroded (MfB2).—This soil is on broad, smooth interstream divides in the uplands. Its surface layer is 3 to 7 inches thick. In many places it is a mixture of the remaining original surface soil and of material from the subsoil. In the less eroded areas, the surface layer is grayish-brown to light yellowish-brown sandy loam, but the color ranges to strong brown and the texture ranges to sandy clay loam in the more eroded areas. The subsoil is 26 to 50 inches thick and consists of yellowish-red to strong-brown, firm clay loam to clay, with common mottles of red and brown.

Included with this soil in mapping were some severely eroded spots where the subsoil is exposed. These areas make up from 5 to 25 percent of the acreage in the mapping unit.

Infiltration is fair, and surface runoff is medium. The hazard of erosion is moderate. This soil is difficult to keep in good tilth, but it can be worked throughout a fairly wide range of moisture content. A crust forms on the severely eroded spots after hard rains, and clods form if those areas are worked when wet. The crust and the clods interfere with germination. As a result, stands of crops are poor and replanting of the severely eroded areas may be necessary. An even stand of tobacco is hard to obtain in the severely eroded spots. Plants in an uneven stand mature at different times, which makes harvesting and curing of the crop difficult and reduces the quality of the tobacco.

About two-thirds of the acreage is cultivated or in pasture, and the rest is in forest or in other uses. Where cultivated, this soil is used chiefly for row crops, especially tobacco, but it is well suited to all the locally grown crops. Practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIe-1, woodland suitability group 5, wildlife suitability group 1)

Mayodan sandy loam, 6 to 10 percent slopes (MfC).—This soil is on narrow side slopes in the uplands. It has a surface layer of grayish-brown to yellowish-brown sandy loam 6 to 12 inches thick. The subsoil is 26 to 45 inches thick and is yellowish-red to strong-brown, firm clay loam to clay, with common mottles of red and brown.

Infiltration is good, and surface runoff is rapid. The hazard of erosion is severe. This soil is easy to keep in good tilth and can be worked throughout a wide range of moisture content.

About one-third of the acreage is cultivated or in pasture, and the rest is in forest or in other uses. The cultivated areas are used chiefly for row crops, especially tobacco, but this soil is well suited to all the locally grown crops. Intensive practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIIe-1, woodland suitability group 5, wildlife suitability group 1)

Mayodan sandy loam, 6 to 10 percent slopes, eroded (MfC2).—This soil is on narrow side slopes in the uplands. Its surface layer is 4 to 6 inches thick. In many places the surface layer is a mixture of the remaining original surface soil and of material from the subsoil. In the less eroded areas, the surface layer is grayish-brown to light yellowish-brown sandy loam, but the color ranges to strong brown and the texture ranges to sandy clay loam in the more eroded spots. The subsoil is 26 to 45 inches thick and consists of yellowish-red to strong-brown, firm clay loam to clay, with common mottles of red and brown.

Included with this soil in mapping were some severely eroded spots where the subsoil is exposed. These areas make up from 5 to 25 percent of the acreage in the mapping unit.

Infiltration is fair, and surface runoff is rapid. The hazard of further erosion is severe. This soil is difficult to keep in good tilth, but it can be worked throughout a fairly wide range of moisture content. A crust forms on the severely eroded spots after hard rains, and clods form if those areas are worked when wet. The crust and the clods interfere with germination. As a result, stands of crops are poor and replanting of the severely eroded areas may be necessary. An even stand of tobacco is hard to obtain. Plants in an uneven stand mature at different times. This makes harvesting and curing of the crop difficult and reduces the quality of the tobacco.

About one-third of the acreage is cultivated or in pasture, and the rest is in forest or in other uses. The cultivated areas are used chiefly for row crops, especially tobacco, but this soil is well suited to all the locally grown crops. Intensive practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIIe-1, woodland suitability group 5, wildlife suitability group 1)

Mayodan sandy loam, 10 to 15 percent slopes, eroded (MfD2).—This soil is on narrow side slopes bordering upland drainageways. It is dominantly moderately eroded, but it is slightly eroded in places. In the moderately eroded areas, the surface layer is grayish-brown to light yellowish-brown sandy loam to strong-brown sandy clay loam 4 to 6 inches thick. In the slightly eroded areas, the surface layer is grayish-brown to yellowish-brown sandy loam 6 to 10 inches thick. The subsoil is 26 to 40 inches thick and consists of yellowish-red to strong-brown, firm clay loam to clay, with common mottles of red and brown. In many places pebbles and cobblestones are on the surface and in the surface layer. Included with this soil in mapping were some severely eroded spots where the subsoil is exposed.

Infiltration is fair to good, and surface runoff is very rapid. The hazard of further erosion is very severe. Where this soil is only slightly eroded, it is easy to keep in good tilth. Where it is moderately eroded, it is difficult to keep in good tilth, but it can be worked throughout a fairly wide range of moisture content. A crust forms on the severely eroded spots after hard rains, and clods form if those areas are worked when wet. The crust and the clods interfere with germination. As a result, stands of crops are poor and replanting of those areas may be necessary.

Most of the acreage is in forest, but a small acreage is in pasture. Also, a small acreage is used for row crops. This soil is well suited to all the locally grown crops. If it is cultivated, however, very intensive practices that effectively control runoff and erosion are needed. (Capability unit IVe-1, woodland suitability group 5, wildlife suitability group 1)

Mayodan sandy loam, 15 to 25 percent slopes (MfE).—This soil is on narrow side slopes bordering major drainageways in the county. It is slightly or moderately eroded. In the slightly eroded areas, the surface layer is grayish-brown to yellowish-brown sandy loam 6 to 9 inches thick. In the moderately eroded areas, the surface layer is grayish-brown to light yellowish-brown sandy loam to strong-brown sandy clay loam 4 to 6 inches thick. The subsoil is 26 to 36 inches thick and consists of yellowish-red to strong-brown, firm clay loam to clay, with common mottles of red and brown. In many places pebbles and cobblestones are on the surface and in the surface layer. Included with this soil in mapping were some severely eroded spots where the subsoil is exposed.

Infiltration is fair to good, and surface runoff is very rapid. This soil is highly susceptible to further erosion.

Most of the acreage is in forest, but a small acreage is in pasture. Where this soil has been cleared, it is suitable for pasture or perennial hay crops. It is not suited to cultivated crops. (Capability unit VIe-1, woodland suitability group 5, wildlife suitability group 1)

Mayodan gravelly sandy loam, 2 to 6 percent slopes (MgB).—This soil is on broad, smooth interstream divides in the uplands. Its surface layer is 7 to 15 inches thick. It is grayish-brown to yellowish-brown gravelly sandy loam that has a content of gravel of 15 to 30 percent. The subsoil is 26 to 50 inches thick and consists of yellowish-red to strong-brown, firm clay loam to clay, with common mottles of red and brown.

Infiltration is good, and surface runoff is medium. The hazard of erosion is moderate. Because of the high content of gravel, many areas of this soil are difficult to till, but tillage can be performed throughout a wide range of moisture content.

About half of the acreage is cultivated or in pasture, and the rest is in forest or in other uses. The cultivated areas are used chiefly for row crops, especially tobacco and cotton, but this soil is well suited to all the locally grown crops. Practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIe-1, woodland suitability group 5, wildlife suitability group 1)

Mayodan gravelly sandy loam, 2 to 6 percent slopes, eroded (MgB2).—This soil is on broad, smooth interstream divides in the uplands. Its surface layer is 4 to 7 inches thick. In many places it is a mixture of the remaining original surface soil and of material from the subsoil. In the less eroded areas, the surface layer is grayish-brown to light yellowish-brown gravelly sandy loam, but the color ranges to strong brown and the texture ranges to gravelly sandy clay loam in the more eroded spots. From 15 to 30 percent of the surface layer is gravel. The subsoil is 26 to 50 inches thick and consists of yellowish-red to strong-brown, firm clay loam to clay, with common mottles of red and brown.

Included with this soil in mapping were some severely eroded spots. Those areas make up from 5 to 25 percent of the acreage in the mapping unit.

Infiltration is fair, and surface runoff is moderate. The hazard of further erosion is moderate. This soil is difficult to keep in good tilth, but it can be worked throughout a fairly wide range of moisture content. A crust forms on the severely eroded spots after hard rains, and clods form if those areas are worked when wet. The crust and the clods interfere with germination. As a result, stands of crops are poor and replanting of the severely eroded spots may be necessary. An even stand of tobacco is hard to obtain. Plants in an uneven stand mature at different times, which makes harvesting and curing of the crop difficult and reduces the quality of the tobacco.

About half of the acreage is cultivated or in pasture, and the rest in forest or in other uses. The cultivated areas are used chiefly for row crops, especially tobacco and cotton, but this soil is well suited to all the locally grown crops. Practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIe-1, woodland suitability group 5, wildlife suitability group 1)

Mayodan gravelly sandy loam, 6 to 10 percent slopes (MgC).—This soil is on narrow side slopes in the uplands. It has a grayish-brown to yellowish-brown surface layer of gravelly sandy loam 6 to 12 inches thick. The content of gravel in the surface layer ranges from 15 to 30 percent. The subsoil is 26 to 45 inches thick. It consists of yellowish-red to strong-brown, firm clay loam to clay, with common mottles of red and brown.

Infiltration is good, and surface runoff is rapid. The hazard of erosion is severe. In many places the high content of gravel makes this soil difficult to till, but tillage can be performed throughout a wide range of moisture content.

About one-third of the acreage is cultivated or in pasture, and the rest is in forest or in other uses. The cultivated areas are used chiefly for row crops, especially tobacco and cotton, but this soil is well suited to all the locally grown crops. Intensive practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIIe-1, woodland suitability group 5, wildlife suitability group 1)

Mayodan gravelly sandy loam, 6 to 10 percent slopes, eroded (MgC2).—This soil is on narrow side slopes in the uplands. Its surface layer is 4 to 6 inches thick and has a content of gravel ranging from 15 to 30 percent. In many places the surface layer is a mixture of the remaining original surface soil and of material from the subsoil. In the less eroded areas, it is grayish-brown to light yellowish-brown gravelly sandy clay loam, but the color ranges to strong brown and the texture ranges to gravelly sandy clay in the more eroded spots. The subsoil is 26 to 45 inches thick and consists of yellowish-red to strong-brown, firm clay loam to clay, with common mottles of red and brown.

Included with this soil in mapping were some severely eroded spots. These make up from 5 to 25 percent of the acreage in the mapping unit.

Infiltration is fair, and surface runoff is rapid. This soil is difficult to keep in good tilth, but it can be worked throughout a fairly wide range of moisture content. A crust forms on the severely eroded spots after hard rains, and clods form if those areas are worked when wet. The crust and the clods interfere with germination. As a result, stands of crops are poor and replanting of those areas may be necessary. An even stand of tobacco is hard to obtain. Plants in an uneven stand mature at different times, which makes harvesting and curing of the crop difficult and reduces the quality of the tobacco.

About one-third of the acreage is cultivated or in pasture, and the rest is in forest or in other uses. The cultivated areas are used chiefly for row crops, especially tobacco and cotton, but this soil is well suited to all the locally grown crops. Where cultivated crops are grown, intensive practices that effectively control runoff and erosion are needed. (Capability unit IIIe-1, woodland suitability group 5, wildlife suitability group 1)

Mayodan silt loam, thin, 2 to 6 percent slopes (MyB).—This soil is on smooth interstream divides in the uplands. Its surface layer is dark grayish-brown to yellowish-brown silt loam 4 to 7 inches thick. The subsoil is 15 to 24 inches thick. It is yellowish-red to strong-brown, firm silty clay loam to clay, with common red mottles. Included in mapping were some areas in which the slope is less than 2 percent.

Infiltration is good, surface runoff is medium, and the hazard of erosion is moderate. This soil is easy to keep in good tilth and can be worked throughout a fairly wide range of moisture content.

About half of the acreage is cultivated or in pasture, and the rest is in forest. The cultivated areas are used chiefly for row crops, but this soil is suited to most of the locally grown crops. Practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIe-2, woodland suitability group 5, wildlife suitability group 1)

Mayodan silt loam, thin, 2 to 6 percent slopes, eroded (MyB2).—This soil is on smooth interstream divides in the uplands. Its surface layer is 3 to 6 inches thick. In many places it is a mixture of the remaining original surface soil and of material from the subsoil. In the less eroded areas, the surface layer is grayish-brown to yellowish-brown silt loam, but the color ranges to strong brown and the texture ranges to silty clay loam in the more eroded spots. The subsoil is 15 to 24 inches thick and consists of yellowish-red to strong-brown, firm silty clay loam to clay, with common mottles of red.

Included with this soil in mapping were some severely eroded spots where the subsoil is exposed. These areas make up from 5 to 25 percent of the acreage in the mapping unit.

Infiltration is fair, and surface runoff is medium. The hazard of erosion is moderate. This soil is difficult to keep in good tilth, but it can be worked throughout a fairly wide range of moisture content. A crust forms on the severely eroded spots after hard rains, and clods form if those areas are worked when wet. The crust and the clods interfere with germination. As a result, stands of crops are poor and replanting of those areas may be necessary.

Where this soil has been cleared, it is used chiefly for row crops and pasture, but it is suited to most of the locally grown crops. About half of the acreage is culti-

vated or in pasture, and the rest is in forest. Practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIe-2, woodland suitability group 5, wildlife suitability group 1)

Mayodan silt loam, thin, 6 to 10 percent slopes (MyC).—This soil is on narrow side slopes in the uplands. The surface layer is dark grayish-brown to yellowish-brown silt loam 4 to 7 inches thick. The subsoil is 15 to 20 inches thick and consists of yellowish-red to strong-brown, firm silty clay loam to clay, with common red mottles.

Infiltration is good, and surface runoff is rapid. The hazard of erosion is severe. This soil is easy to keep in good tilth and can be worked throughout a fairly wide range of moisture content.

Where this soil has been cleared, it is used chiefly for row crops and pasture, but it is suited to most of the locally grown crops. Most of the acreage is in forest, but a small acreage is in other uses. Intensive practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIIe-2, woodland suitability group 5, wildlife suitability group 1)

Mayodan silt loam, thin, 6 to 10 percent slopes, eroded (MyC2).—This soil is on narrow side slopes in the uplands. Its surface layer is 3 to 6 inches thick. In many places the surface layer is a mixture of the remaining original surface soil and of material from the subsoil. In the less eroded areas, the surface layer is grayish-brown to yellowish-brown silt loam, but the color ranges to strong brown and the texture ranges to silty clay loam in the more eroded spots. The subsoil is 15 to 20 inches thick and consists of yellowish-red to strong-brown, firm silty clay loam to clay, with common mottles of red.

Included with this soil in mapping were some severely eroded spots where the subsoil is exposed. These areas make up from 5 to 25 percent of the acreage in the mapping unit.

Infiltration is fair, and surface runoff is rapid. The hazard of further erosion is severe. This soil is difficult to keep in good tilth, but it can be worked throughout a fairly wide range of moisture content. A crust forms on the severely eroded spots after hard rains, and clods form if those areas are worked when wet. The crust and the clods interfere with germination. As a result, stands of crops are poor and replanting of the severely eroded spots may be necessary.

Most of the acreage is in forest, but a small acreage has been cleared. This soil is suited to most of the locally grown crops, but the cleared areas are used chiefly for row crops and pasture. Intensive practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIIe-2, woodland suitability group 5, wildlife suitability group 1)

Mayodan silt loam, thin, 10 to 15 percent slopes (MyD).—This soil is on narrow side slopes bordering drainageways in the uplands. Some areas are slightly eroded, and others are moderately eroded. In the slightly eroded areas, the surface layer is dark grayish-brown to yellowish-brown silt loam 4 to 6 inches thick. In the moderately eroded areas, the surface layer is 3 to 6 inches thick and ranges from grayish-brown to yellowish-brown silt loam to strong-brown silty clay loam. The subsoil is 15 to 18 inches thick and consists of yellowish-red to strong-brown, firm silty clay loam to clay, with common mottles of red. Included with this soil in mapping were some severely eroded spots where the subsoil is exposed.

Infiltration is fair to good, surface runoff is very rapid, and the hazard of further erosion is very severe. Where erosion is only slight, this soil is easy to keep in good tilth. Where erosion is moderate, this soil is difficult to keep in good tilth, but it can be worked throughout a fairly wide range of moisture content. A crust forms on the severely eroded spots after hard rains, and clods form if those areas are worked when wet. The crust and the clods interfere with germination. As a result, stands of crops are poor and replanting of those areas may be necessary.

This soil is suited to most of the locally grown crops, but practically all of the acreage is in forest. Where this soil has been cleared, it is used for row crops and pasture. Very intensive practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IVe–2, woodland suitability group 5, wildlife suitability group 1)

Norfolk Series

The Norfolk series consists of nearly level to sloping, very deep, well-drained soils on Coastal Plain uplands in the southern part of the county. The soils are on broad flats and on smooth, rounded divides that have a difference in elevation of about 20 feet between the highest and the lowest points. They have formed under forest in Coastal Plain sediment. The water table remains below the solum.

Natural fertility and the content of organic matter are low. Permeability is moderate, the available water capacity is medium, and the shrink-swell potential is low. Except in areas that have received lime, these soils are strongly acid. Response is good if suitable applications of lime and fertilizer are made.

In Wake County the Norfolk soils are important for farming. Most of the acreage is cultivated or in pasture, but some of the acreage is in forest.

Representative profile of a Norfolk loamy sand in a cultivated field 1¼ miles west of the New Providence Church and 10 yards north of road:

Ap—0 to 6 inches, grayish-brown (2.5Y 5/2) loamy sand; weak, medium, granular structure; very friable when moist; many fine, fibrous roots; many fine pores; strongly acid; abrupt, smooth boundary.

A2—6 to 15 inches, light yellowish-brown (2.5Y 6/4) loamy sand; weak, coarse, granular structure; very friable when moist; many fine, fibrous roots; many fine pores; strongly acid; abrupt, wavy boundary.

B1t—15 to 17 inches, yellowish-brown (10YR 5/6) sandy clay loam; weak, medium, subangular blocky structure; friable when moist, sticky and slightly plastic when wet; few, fine, fibrous roots; common fine pores; strongly acid; clear, wavy boundary.

B21t—17 to 32 inches, yellowish-brown (10YR 5/8) sandy clay loam; weak, coarse, subangular blocky structure; friable when moist, sticky and slightly plastic when wet; few, fine, fibrous roots; common fine pores; few sesquioxide nodules; few, small, rounded quartz pebbles; strongly acid; clear, wavy boundary.

B22t—32 to 42 inches, yellowish-brown (10YR 5/8) sandy clay loam; common, medium, prominent, red mottles; moderate, medium and coarse, subangular blocky

structure; friable when moist, sticky and slightly plastic when wet; few fine pores; thin, continuous clay films on ped surfaces; few, small, hard sesquioxide nodules; strongly acid; clear, smooth boundary.

B3t—42 to 65 inches, pale-brown (10YR 6/3) sandy clay loam; common, medium, distinct mottles of yellowish brown, red, and light gray; moderate, medium, subangular blocky structure; friable when moist, and red mottles are firm and brittle; few fine pores; thin clay films on ped surfaces; strongly acid; clear, wavy boundary.

C—65 to 72 inches +, mottled red, pale-yellow, reddish-yellow, and light-gray sandy loam; massive (few platy structures occur, probably because of the nature of the parent material); firm and brittle when moist; common fine pores; sand particles appear to be cemented by oriented clay; medium acid.

The A horizons range from 4 to 20 inches in total thickness and from dark grayish brown to pale yellow or strong brown in color. The B horizons range from 50 to 72 inches in combined thickness. Their texture ranges from sandy loam or loam to sandy clay loam that is less than 20 percent silt. The color of the B horizons ranges from yellowish brown to brownish yellow in 10YR hues. In places the B horizons are mottled with red. The combined thickness of the A horizons and B horizons is more than 60 inches. Depth to hard rock is more than 20 feet.

Norfolk soils (fig. 7) occur with Orangeburg, Faceville, Goldsboro, and Wagram soils. They are less red than the Orangeburg and Faceville soils and have a coarser textured subsoil than the Faceville soils. The Norfolk soils are better drained than the Goldsboro soils and have a thinner surface layer than the Wagram soils.

Norfolk loamy sand, 0 to 2 percent slopes (NoA).—This soil is on broad, flat interstream divides in the uplands. The surface layer is dark grayish-brown to pale-yellow loamy sand 8 to 20 inches thick. The subsoil is yellowish-brown to brownish-yellow, friable sandy loam to sandy clay loam and is 50 to 72 inches thick. In many places this soil contains an incipient, discontinuous horizon, with plinthite.

Infiltration is good, and surface runoff is slow. This soil is easy to keep in good tilth and can be worked throughout a wide range of moisture content. It has no limitations to intensive use and no major hazards if it is farmed intensively.

Practically all of the acreage is cultivated or in pasture, but a small acreage is in forest. The cultivated areas are used chiefly for row crops, especially tobacco and cotton, but this soil is well suited to all the locally grown crops. (Capability unit I–1, woodland suitability group 6, wildlife suitability group 1)

Norfolk loamy sand, 2 to 6 percent slopes (NoB).—This soil is on broad, smooth interstream divides in the uplands. Its surface layer is dark grayish-brown to pale-yellow loamy sand 8 to 20 inches thick. The subsoil is yellowish-brown to brownish-yellow, friable sandy loam to sandy clay loam 50 to 72 inches thick. In many places this soil contains an incipient, discontinuous horizon, with plinthite.

Infiltration is good, and surface runoff is medium. The hazard of erosion is moderate. This soil is easy to keep in good tilth and can be worked throughout a wide range of moisture content.

Practically all of the acreage is cultivated or in pasture, and only a small acreage is in forest. This soil is well suited to all the locally grown crops and is used chiefly for row crops, especially tobacco and cotton. Practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIe–1, woodland suitability group 6, wildlife suitability group 1)

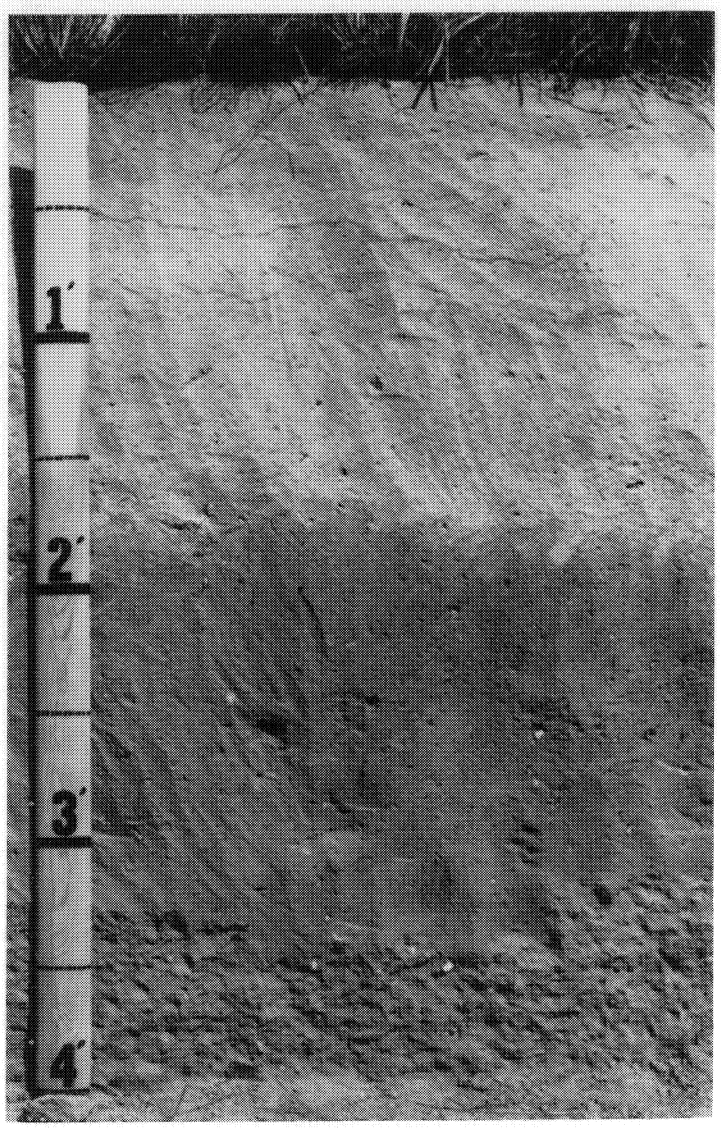

Figure 7.—**Profile of a Norfolk loamy sand.**

Norfolk loamy sand, 2 to 6 percent slopes, eroded (NoB2).—This soil is on broad, smooth interstream divides in the uplands. Its surface layer is 4 to 8 inches thick. In many places the surface layer is a mixture of the remaining original surface soil and of material from the subsoil. In the less eroded areas, the surface layer is grayish-brown to pale-yellow loamy sand, but the color ranges to strong brown and the texture ranges to sandy clay loam in the more eroded spots. The subsoil is yellowish-brown to brownish-yellow, friable sandy loam to sandy clay loam 50 to 72 inches thick. In many places this soil contains an incipient, discontinuous horizon, with plinthite.

Included with this soil in mapping were some severely eroded spots where the subsoil is exposed. These areas make up from 5 to 25 percent of the acreage in the mapping unit.

Infiltration is fair, and surface runoff is medium. The hazard of further erosion is moderate. This soil is difficult to keep in good tilth, but it can be worked throughout a fairly wide range of moisture content. A crust forms on the severely eroded spots after hard rains, and clods form if those areas are worked when wet. The crust and the clods interfere with germination. As a result, stands of crops are poor and replanting of those areas may be necessary. An even stand of tobacco is hard to obtain. Plants in an uneven stand mature at different times. This makes harvesting and curing of the crop difficult and reduces the quality of the tobacco.

This soil is well suited to all the locally grown crops, and it is used chiefly for row crops, especially tobacco and cotton. Part of the acreage is in pasture, however, and a small acreage is in forest. Practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIe–1, woodland suitability group 6, wildlife suitability group 1)

Norfolk loamy sand, 6 to 10 percent slopes (NoC).—This soil is on narrow side slopes in the uplands. The surface layer is dark grayish-brown to pale-yellow loamy sand 8 to 20 inches thick. The subsoil is yellowish-brown to brownish-yellow, friable sandy loam to sandy clay loam 50 to 60 inches thick. In many places this soil contains an incipient and discontinuous horizon, with plinthite.

Infiltration is good, and surface runoff is rapid. The hazard of erosion is severe. This soil is easy to keep in good tilth and can be worked throughout a wide range of moisture content.

About three-fourths of the acreage is cultivated or in pasture, and the rest is in forest and in other uses. This soil is well suited to all the locally grown crops, but the cultivated areas are used chiefly for row crops, especially tobacco and cotton. Intensive practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIIe–1, woodland suitability group 6, wildlife suitability group 1)

Norfolk loamy sand, 6 to 10 percent slopes, eroded (NoC2).—This soil is on narrow side slopes in the uplands. Its surface layer is 4 to 6 inches thick. In many places the surface layer is a mixture of the remaining original surface soil and of material from the subsoil. In the less eroded areas, the surface layer is grayish-brown to pale-yellow loamy sand, but the color ranges to strong brown and the texture ranges to sandy clay loam in the severely eroded spots. The subsoil is yellowish-brown to brownish-yellow, friable sandy loam to sandy clay loam that is 50 to 60 inches thick. In many places this soil contains an incipient, discontinuous horizon, with plinthite.

Included with this soil in mapping were some spots that are eroded to the extent that the subsoil is exposed. These areas occupy from 5 to 25 percent of the acreage in the mapping unit.

Infiltration is fair, and surface runoff is rapid. The hazard of further erosion is severe. This soil is difficult to keep in good tilth, but it can be worked throughout a fairly wide range of moisture content. A crust forms on the severely eroded spots after hard rains, and clods form if those areas are worked when wet. The crust and the clods interfere with germination. As a result, stands of crops are poor and replanting of those areas may be necessary. An even stand of tobacco is hard to obtain. Plants in an uneven stand mature at different times, which makes harvesting and curing of the crop difficult and reduces the quality of the tobacco.

About three-fourths of the acreage is cultivated or in pasture, and the rest is in forest or in other uses. This soil is well suited to all the locally grown crops, but the cultivated areas are used chiefly for row crops, especially tobacco and cotton. Intensive practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIIe–1, woodland suitability group 6, wildlife suitability group 1)

Orangeburg Series

The Orangeburg series consists of gently sloping and sloping, very deep, well-drained soils on Coastal Plain uplands in the southern part of the county. These soils are on broad, smooth, rounded divides that have a difference in elevation of about 20 feet between the highest and the lowest points. They have formed under forest in Coastal Plain deposits. The water table remains below the solum.

Natural fertility and the content of organic matter are low, and permeability is moderate. The available water capacity is medium, and the shrink-swell potential is low. Except in areas that have received lime, these soils are medium acid to strongly acid. Response is good if suitable applications of lime and fertilizer are made.

The Orangeburg soils of Wake County are of only minor importance for farming. Most of the acreage is cultivated or in pasture, but some is in forest.

Representative profile of an Orangeburg loamy sand in a cultivated field one-half mile north of Partins Pond and 50 yards east of the road:

Ap—0 to 8 inches, grayish-brown (10YR 5/2) loamy sand; weak, fine, granular structure; very friable when moist; medium acid; clear, smooth boundary.

A2—8 to 12 inches, pale-brown (10YR 6/3) loamy sand; weak, fine, granular structure; very friable when moist; medium acid; clear, smooth boundary.

B21t—12 to 19 inches, reddish-yellow (5YR 6/8) sandy clay loam; moderate, medium, subangular blocky structure; friable when moist; strongly acid; gradual, smooth boundary.

B22t—19 to 26 inches, yellowish-red (5YR 5/8) sandy clay loam; moderate, medium, subangular blocky structure; friable when moist; strongly acid; gradual, smooth boundary.

B23t—26 to 50 inches, yellowish-red (5YR 5/8) sandy clay loam; common, medium, distinct, brownish-yellow mottles; moderate, medium, subangular blocky structure; friable when moist; strongly acid; gradual, smooth boundary.

B3—50 to 66 inches, red (2.5YR 5/6) sandy loam that contains pockets of yellow (10YR 7/8) sandy clay loam; moderate, medium, subangular blocky structure; friable when moist; strongly acid; gradual, diffuse boundary.

C—66 to 72 inches +, mottled red, yellow, and gray loamy sand; loose when moist; strongly acid.

The A horizons range from 6 to 20 inches in combined thickness and from grayish brown or pale yellow to light brownish gray or olive brown in color. The B horizons range from 50 to more than 72 inches in combined thickness and from sandy loam to sandy clay loam in texture. Their color ranges from reddish yellow to red or yellowish red or strong brown in 2.5YR to 7.5YR hues. The combined thickness of the A hori-

zons and B horizons is greater than 60 inches. Depth to hard rock is more than 20 feet.

Orangeburg soils occur with Norfolk and Faceville soils. They are more reddish than the Norfolk soils and have a coarser textured subsoil than the Faceville soils.

Orangeburg loamy sand, 2 to 6 percent slopes (OrB).—This soil is on broad, smooth interstream divides in the uplands. Its surface layer is grayish-brown, light brownish-gray, and pale-yellow to olive-brown loamy sand 8 to 20 inches thick. The subsoil is red to yellowish-red and strong-brown, friable sandy loam to sandy clay loam that is 50 to 72 inches thick (fig. 8). In many places this soil contains an incipient, discontinuous horizon, with plinthite.

Included with this soil in mapping were a few places where the slope is less than 2 percent. Also included were some spots where gravel is on and in the surface layer.

Infiltration is good, and surface runoff is medium. The hazard of erosion is moderate. This soil is easy to keep in good tilth and can be worked throughout a wide range of moisture content.

This soil is well suited to all the locally grown crops, and practically all of the acreage is cultivated or in pasture. The cultivated areas are used chiefly for row crops, especially tobacco and cotton. Practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIe–1, woodland suitability group 6, wildlife suitability group 1)

Orangeburg loamy sand, 2 to 6 percent slopes, eroded (OrB2).—This soil is on broad, smooth interstream divides in the uplands. Its surface layer is 6 to 8 inches thick. In many places the surface layer is a mixture of the original surface soil and of material from the subsoil. In the less eroded areas, the surface layer is grayish-brown to light-brown loamy sand, but the texture ranges to sandy clay loam and the color is reddish in the more eroded spots. The subsoil is red to yellowish-red or strong-brown, friable sandy loam to sandy clay loam that is 50 to 72 inches thick. In many places this soil contains an incipient, discontinuous horizon, with plinthite.

Included with this soil in mapping were some areas where gravel is on the surface and in the surface layer. Some severely eroded spots occupy from 5 to 25 percent of the acreage in the mapping unit.

Infiltration is fair, and surface runoff is medium. The hazard of further erosion is moderate. This soil is difficult to keep in good tilth, but it can be worked throughout a fairly wide range of moisture content. A crust forms on the severely eroded spots after hard rains, and clods form if those areas are worked when wet. The crust and the clods interfere with germination. As a result, stands of crops are poor and replanting of those areas may be necessary. An even stand of tobacco is hard to obtain. Plants in an uneven stand mature at different times, and this makes harvesting and curing of the crop difficult and reduces the quality of the tobacco.

Practically all of the acreage is cultivated or in pasture, but a small acreage is in forest. This soil is well suited to all the locally grown crops, especially tobacco and cotton. Practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIe–1, woodland suitability group 6, wildlife suitability group 1)

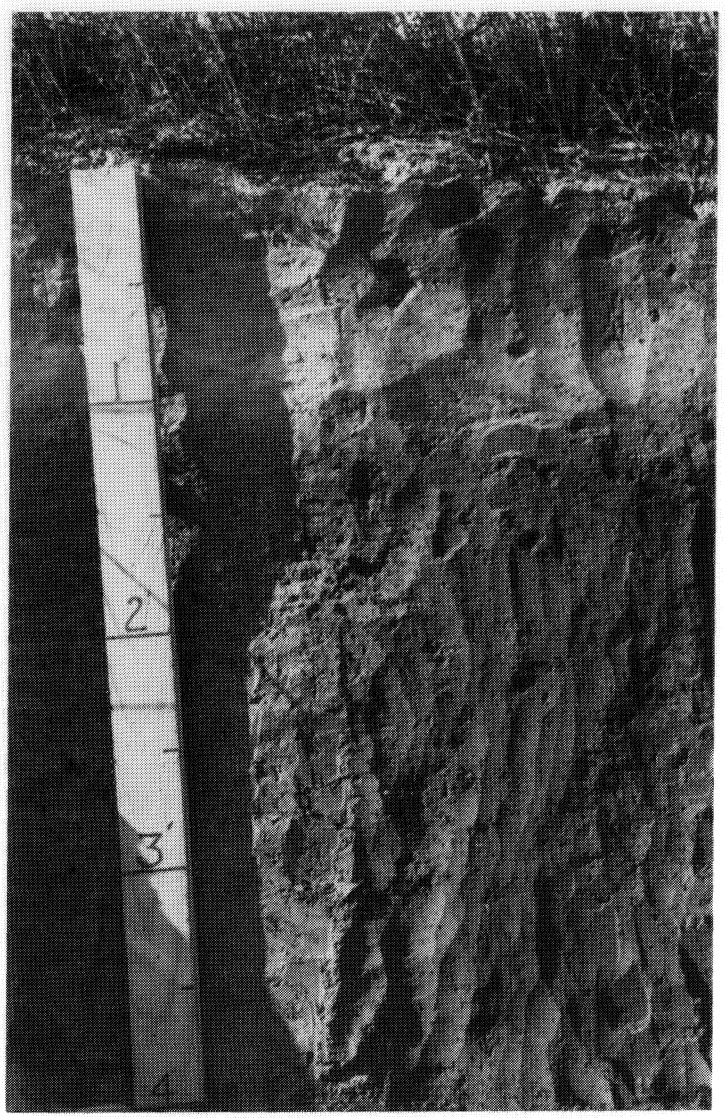

Figure 8.—**An Orangeburg loamy sand to a depth of 4 feet.**

Orangeburg loamy sand, 6 to 10 percent slopes, eroded (OrC2).—This soil is on narrow side slopes in the uplands. In about three-fourths of the acreage, it is moderately eroded. In the rest it is slightly eroded or severely eroded. The severely eroded spots make up from 5 to 25 percent of the acreage in the mapping unit. In many places the surface layer is a mixture of the remaining original surface soil and of material from the subsoil. In the severely eroded spots, the subsoil is exposed. In the slightly eroded areas, the surface layer is grayish-brown to light-brown loamy sand that is 6 to 8 inches thick, but the texture ranges to sandy clay loam and the color is reddish in the severely eroded spots. The subsoil is 50 to 60 inches thick and is red to yellowish-red and strong-brown, friable sandy loam to sandy clay loam. In many places this soil contains an incipient, discontinuous horizon, with plinthite. Included in mapping were some areas where gravel is on the surface and in the surface layer.

Infiltration is fair, and surface runoff is rapid. The hazard of further erosion is severe. This soil is difficult to keep in good tilth, but it can be worked throughout a wide range of moisture content. A crust forms on the severely eroded spots after hard rains, and clods form if those areas are worked when wet. The crust and the clods interfere with germination. As a result, stands of crops are poor and replanting of those areas may be necessary. An even stand of tobacco is hard to obtain. Plants in an uneven stand mature at different times, and this makes harvesting and curing difficult and reduces the quality of the tobacco.

About three-fourths of the acreage is cultivated or in pasture, and the rest is in forest or in other uses. This soil is well suited to all the locally grown crops. The cultivated areas are used chiefly for row crops, especially tobacco and cotton. Intensive practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIIe–1, woodland suitability group 6, wildlife suitability group 1)

Pinkston Series

The Pinkston series consists of gently sloping to steep, moderately deep, somewhat excessively drained soils in fairly small areas on Piedmont uplands in the western part of the county. These soils are on side slopes and on rounded divides that have a difference in elevation of about 75 feet between the highest and the lowest points. They have formed under forest in material that weathered from sandstone and shale of Triassic age. The water table remains below the solum.

Natural fertility and the content of organic matter are low, and permeability is moderate to moderately rapid. The available water capacity and the shrink-swell potential are low. Except in areas that have received lime, these soils are strongly acid. Response is fairly good if suitable applications of lime and fertilizer are made.

The Pinkston soils of Wake County are not important for farming. Most of the acreage is in forest.

Representative profile of a Pinkston sandy loam in a cultivated field three-fourths of a mile southwest of the entrance to Raleigh-Durham Airport, one-fourth of a mile west and south on a farm road, and 50 yards south of road:

Ap—0 to 5 inches, brown (10YR 5/3) sandy loam; weak, fine, granular structure; very friable when moist; common quartz pebbles; medium acid; clear, wavy boundary.

B2—5 to 17 inches, yellowish-red (5YR 5/6) sandy loam; common, medium, light yellowish-brown and pale-brown mottles; weak, medium, subangular blocky structure; quartz gravel makes up 25 percent of horizon, by volume; friable when moist; strongly acid; gradual boundary.

B3—17 to 25 inches, yellowish-red (5YR 5/6) sandy loam; common, medium, distinct, pinkish-gray and strong-brown mottles; structureless; very friable when moist; quartz gravel makes up 35 percent of horizon, by volume; strongly acid; gradual boundary.

C—25 to 36 inches +, partly weathered sandstone that has a texture of gravelly sandy loam; very strongly acid.

The A horizon ranges from 4 to 10 inches in thickness and from pale brown to dark brown in color. The B horizons range from 5 to 30 inches in combined thickness. Their color ranges from yellowish brown to yellowish red in 10YR to 5YR hues. The texture of the B horizons ranges from loam to sandy loam, and their structure ranges from weak, fine, subangular blocky to massive. The C horizon is single grain or massive. Depth to hard rock ranges from 2 to 3 feet.

Pinkston soils occur with Louisburg, Mayodan, and Granville soils. They contain less weatherable minerals than the Louisburg soils, and they have a coarser textured subsoil than the Mayodan and Granville soils.

Pinkston sandy loam, 0 to 10 percent slopes (PkC).—This soil is on small ridges and side slopes in the uplands. Its surface layer is pale-brown to dark-brown sandy loam 4 to 10 inches thick. The subsoil is 5 to 30 inches thick and consists of yellowish-brown to yellowish-red, very friable or friable sandy loam to sandy clay loam.

Included with this soil in mapping were some areas that are moderately eroded. Also included were some areas where 20 to 50 percent of the surface is covered with gravel and from 20 to 50 percent of the surface layer consists of gravel.

Infiltration is good, and surface runoff is medium to rapid. The hazard of erosion is very severe. This soil is easy to keep in good tilth and can be worked throughout a wide range of moisture content.

About two-thirds of the acreage is in forest, and the rest is cultivated or in pasture. This soil is fairly well suited to many of the locally grown crops. Where it is cultivated, however, very intensive practices that effectively control runoff and erosion are necessary. During rainy seasons, this soil is subject to leaching of mobile plant nutrients because of its coarse texture. It is droughty during dry seasons. (Capability unit IVe–3, woodland suitability group 12, wildlife suitability group 4)

Pinkston sandy loam, 10 to 45 percent slopes (PkF).—This soil is on side slopes in the uplands. Its surface layer is pale-brown to dark-brown sandy loam 4 to 8 inches thick. The subsoil is 5 to 20 inches thick and consists of yellowish-brown to yellowish-red, very friable or friable sandy loam to sandy clay loam.

Included with this soil in mapping were some areas that are moderately eroded. Also included were some areas where from 20 to 50 percent of the surface is covered with gravel and from 20 to 50 percent of the surface layer consists of gravel.

Infiltration is good. Surface runoff is very rapid.

Practically all of the acreage is in forest. Because of the steepness of the slopes and the shallowness of the subsoil, this soil should not be cleared. (Capability unit VIIe–1, woodland suitability group 12, wildlife suitability group 4)

Plummer Series

The Plummer series consists of nearly level, deep, poorly drained soils on uplands of the Coastal Plain. These soils occupy small areas in depressions in the southern part of the county, where the difference in elevation is about 5 feet between the highest and the lowest points. The seasonally high water table is at the surface.

Natural fertility is very low, and the content of organic matter is low. Permeability is rapid, and the available water capacity and the shrink-swell potential are low. Flooding is frequent, and the floodwaters remain for a long period of time. Except in areas that have received lime, these soils are strongly acid. Where proper drainage is provided, response is moderate if suitable applications of lime and fertilizer are made.

Plummer soils are limited in suitability for crops, and they are not important for farming. Most of the acreage is in forest, but a small acreage is in pasture.

Representative profile of Plummer sand in a pasture 1.1 miles south of Holland station, 1,300 yards northwest on a farm road, and 15 yards east of road:

O2—1 inch to 0, very dark brown (10YR 2/2) decomposed grass, weeds, and other litter; medium acid.

Ap—0 to 4 inches, very dark brown (10YR 2/2) sand; structureless; very friable when moist; many fine and medium, fibrous roots; many fine pores; medium acid; clear, smooth boundary.

A1g—4 to 11 inches, mottled dark-gray (10YR 4/1) and gray (10YR 6/1) sand; structureless; very friable when moist; common, fine, fibrous roots; many fine pores; medium acid; clear, irregular boundary.

A21g—11 to 36 inches, gray (10YR 6/1) sand; very few, fine, distinct, very pale brown stains of organic matter; structureless; very friable when moist; few, fine, fibrous roots; many fine pores; some sand grains are coated, but many are uncoated; medium acid; clear, smooth boundary.

A22g—36 to 50 inches, light-gray (10YR 7/1) sand; structureless; loose when moist; sand grains are uncoated; various feldspar colors stand out among the light-gray quartz sand grains; few, fine, subrounded quartz pebbles; medium acid.

Btg—50 to 60 inches, gray (10YR 6/1) sandy loam; common, medium, distinct mottles of brownish yellow; weak, medium, subangular blocky structure; friable when moist; strongly acid; gradual, wavy boundary.

Cg—60 to 72 inches +, gray (10YR 6/1) loamy sand; structureless; very friable when moist; strongly acid.

The A horizons range from 40 to 60 inches in combined thickness and from very dark brown to gray or black in color. In many places the A horizons are mottled with gray or dark gray. The Btg horizon ranges from 10 inches to more than 40 inches in thickness. Its texture is sandy loam to sandy clay loam, and its color is gray of 10YR hue, mottled with brownish yellow. The combined thickness of the A and B horizons is 60 inches or more. Depth to hard rock is 20 feet or more.

Plummer soils occur with Rains soils, but they have a thicker surface layer than those soils.

Plummer sand (0 to 2 percent slopes) (Ps).—This is the only soil of the Plummer series mapped in Wake County. It is in upland depressions. The surface layer is very dark brown or gray to black sand 40 to 60 inches thick. The subsoil is light-gray, very friable sandy clay loam to sandy loam 10 to 40 inches thick.

Infiltration is good, and surface runoff is slow to ponded. Wetness and surface ponding are severe hazards to crops. Where adequately drained, this soil is easy to keep in good tilth and can be worked throughout a wide range of moisture content.

Practically all of the acreage is in forest, but if it is properly drained, this soil can be used to grow a few perennial crops that are suitable for grazing. Both surface and subsurface drainage are needed if cultivated crops are grown. (Capability unit IVw-1, woodland suitability group 8, wildlife suitability group 3)

Rains Series

The Rains series consists of nearly level, very deep, poorly drained soils on uplands of the Coastal Plain. These soils are in depressions where the difference in elevation is about 5 feet between the highest and the lowest points. These soils are in the southern part of the county, where they occupy both large and small areas. They have formed under forest in Coastal Plain deposits. A seasonally high water table is at the surface.

Natural fertility is low. The content of organic matter is medium, and permeability and the shrink-swell potential are moderate. Flooding is frequent, and the floodwaters stay on the surface for a long time. Except in areas that have received lime, these soils are very strongly acid or strongly acid. Where the soils are properly drained, response is good if suitable applications of lime and fertilizer are made.

The Rains soils of Wake County are of only minor importance for farming. Most of the acreage is in mixed hardwoods and pines, but a small acreage is in pasture or in cultivated crops.

Representative profile of Rains fine sandy loam in a cultivated field 1.7 miles south of Willow Springs and 100 yards west of road:

Ap—0 to 8 inches, dark grayish-brown (10YR 4/2) fine sandy loam; weak, medium, granular structure; very friable when moist; common, fine, fibrous roots; many fine pores; medium acid; clear, smooth boundary.

B21tg—8 to 13 inches, grayish-brown (10YR 5/2) sandy clay loam; common, medium, distinct, yellowish-brown mottles; weak, fine and medium, subangular blocky structure; friable when moist, sticky and slightly plastic when wet; few, fine, fibrous roots; many fine pores; thin clay films on ped surfaces; strongly acid; clear, wavy boundary.

B22tg—13 to 22 inches, grayish-brown (2.5Y 5/2) sandy clay loam; common, medium, distinct, yellowish-brown mottles; weak, medium, subangular blocky structure; friable when moist, sticky and slightly plastic when wet; few, fine, fibrous roots; many fine pores; thin clay films on ped surfaces; strongly acid; clear, wavy boundary.

B23tg—22 to 28 inches, gray (10YR 5/1) heavy sandy clay loam; common, medium, distinct, yellowish-brown mottles; weak, medium, subangular blocky structure; friable when moist, sticky and slightly plastic when wet; many fine pores; medium clay films on ped surfaces; very strongly acid; clear, irregular boundary.

B3tg—28 to 65 inches, gray (10YR 5/1) sandy clay loam; many, medium, prominent, strong-brown mottles; weak, coarse, subangular blocky structure tending to massive; strong-brown mottles are slightly brittle and are friable when moist; gleyed mottles are friable when moist and are slightly sticky and slightly plastic when wet; strongly oriented clay films in cracks; few, small, rounded pebbles; very strongly acid.

C—65 to 72 inches +, gray (10YR 5/1) loamy sand; structureless; friable when moist; very strongly acid.

The Ap horizon ranges from 6 to 20 inches in thickness and from very dark gray to grayish brown or dark grayish brown in color. The B horizons range from 40 to 60 inches or more in combined thickness and from sandy loam to clay loam in texture. The color of the B horizons ranges from gray to grayish brown in 10YR to 5Y hues, and these horizons are mottled with yellow or brown in many places. The combined thickness of the A and B horizons is more than 60 inches. Depth to hard rock is 20 feet or more.

Rains soils occur with Lynchburg and Plummer soils. They are more poorly drained than the Lynchburg soils and have a thinner surface layer than the Plummer soils.

Rains fine sandy loam (0 to 2 percent slopes) (Ra).—This soil is in depressions in the uplands. It is the only Rains soil mapped in Wake County. The surface layer is very dark gray to grayish-brown fine sandy loam 6 to 20 inches thick. The subsoil is 40 to 60 inches thick and consists of gray to grayish-brown, friable sandy loam to clay loam, with common mottles of yellow and brown.

Included with this soil in mapping were a few areas where the subsoil is clay. Also included were a few areas of a very poorly drained soil that has a surface layer of loam.

Infiltration is good, and surface runoff is slow to ponded. Wetness and surface ponding are severe hazards to crops. Where this soil is adequately drained, it is easy to keep in good tilth and can be worked throughout a wide range of moisture content.

If this soil is properly drained, it is well suited to many of the locally grown crops. Both surface and subsurface drainage are needed, however, if cultivated crops are grown. Most of the acreage is in forest, but a small acreage is cultivated or in pasture. (Capability unit IIIw–3, woodland suitability group 7, wildlife suitability group 3)

Roanoke Series

The Roanoke series consists of nearly level, deep, poorly drained soils that occupy large areas on low stream terraces. These soils are in all parts of the county near the large streams, and they have formed under forest in alluvial deposits. A seasonally high water table is at the surface.

Natural fertility and the content of organic matter are medium, permeability is slow, and the available water capacity is medium. The shrink-swell potential is high to moderate. Flooding is frequent, but the floodwaters remain for only a short time. Except in areas where lime has been applied, these soils are strongly acid. Where proper drainage is provided, response is fairly good if suitable applications of lime and fertilizer are made.

In Wake County the Roanoke soils are not important for farming. Most of the acreage is in mixed hardwoods and some pines, but a small acreage is cultivated or in pasture.

Representative profile of Roanoke fine sandy loam in a wooded area 0.6 of a mile southwest of Plymouth Church on a farm road, and 100 yards southeast of the farm road:

O1—2 inches to 1 inch, undecomposed forest litter.
O2—1 inch to 0, decomposed forest litter.
A1—0 to 7 inches, dark grayish-brown (10YR 4/2) fine sandy loam; few, medium, distinct, brown mottles; weak, coarse, granular structure; very friable when moist; many fine and medium, fibrous roots and few, large woody roots; many fine pores; slightly acid; clear, wavy boundary.
A2—7 to 11 inches, grayish-brown (10YR 5/2) fine sandy loam; many, coarse, distinct, light brownish-gray (10YR 6/2) mottles; weak, coarse, granular structure; very friable when moist, slightly brittle; few, fine, woody roots; many fine pores; slightly acid; clear, smooth boundary.
B1tg—11 to 15 inches, gray (10YR 6/1) sandy clay loam; common, medium, distinct, brownish-yellow and few, fine, prominent, strong-brown mottles; moderate, coarse, subangular blocky structure; firm when moist, slightly sticky and slightly plastic when wet; few, fine, woody roots; common fine pores; medium clay films on ped surfaces; medium acid; clear, wavy boundary.
B21tg—15 to 22 inches, gray (10YR 5/1) clay; common, medium, distinct, yellowish-brown and few, medium, prominent, yellowish-red mottles; very coarse, prismatic primary structure breaking to strong, coarse, angular blocky structure; very firm when moist, sticky and plastic when wet; many fine, woody roots in vertical cracks; thick clay films on ped surfaces; strongly acid; gradual, wavy boundary.
B22tg—22 to 31 inches, gray (10YR 5/1) heavy clay loam; few, fine, distinct, yellow mottles; very coarse, prismatic primary structure breaking to strong, coarse, angular blocky structure; very firm when moist, sticky and plastic when wet; few, fine, woody roots in vertical cracks; thick clay films on ped surfaces; strongly acid; gradual, wavy boundary.
B3tg—31 to 38 inches, gray (10YR 6/1) sandy clay loam; few, fine and medium, distinct, yellowish-brown mottles; weak, coarse, angular blocky structure; firm when moist, sticky and plastic when wet; thin, discontinuous clay films on ped surfaces; medium acid; gradual, wavy boundary.
C1g—38 to 42 inches, grayish-brown (10YR 5/2) sandy loam; massive; hard in place; friable when moist, slightly sticky and slightly plastic when wet; slightly acid; clear, wavy boundary.
C2g—42 to 45 inches +, gray (10YR 6/1) sandy loam; few, fine, distinct, olive mottles; massive; friable when moist, slightly sticky and slightly plastic when wet; slightly acid.

The A horizons range from 6 to 20 inches in combined thickness and from dark gray to grayish brown or dark grayish brown in color. The B horizons range from 20 to 30 inches in combined thickness and from sandy clay loam to clay in texture. The color of the Bt horizons is gray in 2.5Y and 10YR hues. In many places the Bt horizons are mottled with yellow and brown. In many areas the lower boundary of the B3tg horizon separates that horizon from a stone line, sand, or unconsolidated sand and clay. The combined thickness of the A horizons and B horizons ranges from 30 to 40 inches. Depth to hard rock is more than 5 feet and commonly is more than 15 feet.

Roanoke soils occur with Wahee and Wehadkee soils. They are more poorly drained than the Wahee soils and have less sand in their subsoil than the Wehadkee soils.

Roanoke fine sandy loam (0 to 2 percent slopes) (Ro).—This is the only Roanoke soil mapped in Wake County. It is on low stream terraces. The surface layer is dark-gray to grayish-brown fine sandy loam 6 to 20 inches thick. The subsoil is gray, very firm clay to clay loam that is mottled with yellow and brown in many places. The subsoil is 20 to 30 inches thick.

Infiltration is good, and surface runoff is slow to ponded. Wetness and surface ponding are severe hazards if crops are grown. Where this soil is properly drained, it is easy to keep in good tilth. Tillage is sometimes restricted after heavy rains, however, because of the slowly permeable subsoil.

If this soil is properly drained, it is suited to pasture, hay, and some row crops. Surface and subsurface drainage are needed if cultivated crops are grown, but obtaining proper drainage is difficult. Most of the acreage is in forest, but some of it is cultivated or in pasture. (Capability unit IVw–1, woodland suitability group 2, wildlife suitability group 3)

Swamp (Sw) is a miscellaneous land type that is covered by water most of the time. It is not extensive but occurs at the heads of manmade lakes in most parts of the county. The soil material has washed from soils of uplands during periods of high rainfall. Swamp sustains a cover of alder, cattails, and bog rush.

Because of wetness and inaccessibility, few observations of the soil characteristics of this land type have been made. Therefore, an onsite investigation is necessary before use is planned. (Capability unit VIIw–1,

woodland suitability group 14, wildlife suitability group 3)

Troup Series

The Troup series consists of nearly level or gently sloping, very deep, well-drained soils on Coastal Plain uplands in the southern part of the county. These soils are on broad flats and on smooth, rounded divides where the difference in elevation is about 10 feet between the highest and the lowest points. The water table remains below the solum.

Natural fertility and the content of organic matter are low, permeability is rapid, and the available water capacity is very low. The shrink-swell potential is low. Except in areas that have received lime, these soils are strongly acid. Response is moderately good if suitable applications of lime and fertilizer are made.

Though most of the acreage is cultivated, these soils are not important for farming. In Wake County they are mapped only with the Wagram soils.

Representative profile of a Troup sand in a cultivated field 2½ miles south-southeast of Varina on N.C. Highway No. 42, one-eighth of a mile north on a farm road, and 10 yards west of that road:

Ap—0 to 8 inches, dark grayish-brown (10YR 4/2) sand; single grain; loose when moist or dry; many, fine, fibrous roots; many fine pores; slightly acid; abrupt, wavy boundary.

A21—8 to 27 inches, light yellowish-brown (2.5Y 6/4) sand; single grain; loose when moist or dry; few, fine, fibrous roots; few fine pores; slightly acid; gradual, smooth boundary.

A22—27 to 49 inches, light yellowish-brown (2.5Y 6/4) sand; common, medium, faint, pale-yellow mottles; single grain; loose when moist or dry; few, fine, fibrous roots; few fine pores; strongly acid; clear, smooth boundary.

B1—49 to 58 inches, yellowish-brown (10YR 5/6) sandy loam; common, coarse, distinct, strong-brown (7.5YR 5/6) mottles; weak, fine and medium, subangular blocky structure; friable when moist, sticky and slightly plastic when wet; few, fine, fibrous roots; few fine pores; strongly acid; clear, smooth boundary.

B21t—58 to 64 inches, yellowish-brown (10YR 5/6) sandy clay loam; common, medium, prominent, yellowish-red and common, medium, distinct, strong-brown mottles; weak, fine and medium, subangular blocky structure; friable when moist, sticky and slightly plastic when wet; few fine pores; thick coatings on sand grains; few small quartz pebbles; strongly acid; abrupt, smooth boundary.

B22t—64 to 74 inches, mottled brownish-yellow (10YR 6/8), strong-brown (7.5YR 5/6), and yellowish-red (5YR 5/8) clay loam; moderate, medium, subangular blocky structure; friable when moist, sticky and slightly plastic when wet; few fine pores; thick coatings on sand grains; few clay bridges; few small quartz pebbles; red (2.5YR 4/6), brittle sesquioxide nodules; strongly acid; clear, smooth boundary.

B3—74 to 83 inches, strong-brown (7.5YR 5/6) sandy clay loam; few, fine, prominent, red mottles; weak, fine and medium, subangular blocky structure; friable when moist, slightly sticky and slightly plastic when wet; few fine pores; strongly acid; gradual, smooth boundary.

C—83 to 88 inches +, mottled reddish-yellow (7.5YR 6/8) and yellowish-red (5YR 5/8) loamy sand; massive; brittle and friable when moist; few, thin, discontinuous iron coatings on sand grains; medium acid.

The A horizons range from 40 to 60 inches in thickness and from dark grayish brown to light yellowish brown in color. The B horizons range from 30 to more than 72 inches in combined thickness and from sandy loam to sandy clay loam in texture. The color of the B horizons ranges from yellowish brown to strong brown in 10YR and 7.5YR hues, and generally the B horizons are mottled with yellowish red and strong brown. The combined thickness of the A horizons and B horizons ranges from 60 to more than 80 inches. Depth to hard rock is generally more than 20 feet.

Troup soils occur with Wagram soils. They have a thicker surface layer, however, than the Wagram soils.

Vance Series

The Vance series consists of gently sloping and sloping, moderately deep, well-drained soils on Piedmont uplands that are mostly in the northeastern and eastern parts of the county. These soils are on side slopes and on rounded divides where the difference in elevation is about 20 feet between the highest and the lowest points. They have formed under forest in material that weathered from granite, gneiss, and other acidic rocks. The water table remains below the solum.

Natural fertility is medium, and the content of organic matter is low. Permeability is slow, and the available water capacity is medium. The shrink-swell potential is moderate. Except in areas that have received lime, these soils are medium acid to strongly acid. Response is good if suitable applications of lime and fertilizer are made.

The Vance soils of Wake County are moderately important for farming. Most of the acreage is cultivated or in pasture, but a small acreage is in forest.

Representative profile of a Vance sandy loam in a cultivated field 3.5 miles west of the Wakefield Church, 600 feet northeast on a farm road, and 15 feet south of the farm road:

Ap—0 to 5 inches, grayish-brown (10YR 5/2) sandy loam; weak, medium and coarse, granular structure; very friable when moist; many fine, fibrous roots; few fine pores; medium acid; abrupt, smooth boundary.

B21t—5 to 14 inches, yellowish-brown (10YR 5/8) clay; few, fine, prominent, red mottles; weak, coarse, prismatic primary structure breaking to moderate, coarse, angular blocky structure; very firm when moist, sticky and plastic when wet; common, fine, fibrous roots in cracks between the peds; common fine pores; medium clay films on ped surfaces; strongly acid; clear, smooth boundary.

B22t—14 to 23 inches, strong-brown (7.5YR 5/6) clay; common, fine, prominent, red mottles; moderate, medium, angular blocky structure; very firm when moist, sticky and plastic when wet; few, fine, fibrous roots in cracks between the peds; few fine pores; medium clay films on ped surfaces; strongly acid; clear, wavy boundary.

B3—23 to 29 inches, yellowish-brown (10YR 5/8) clay; many, medium, prominent, red mottles; moderate, very fine and fine, angular blocky structure; firm when moist, sticky and plastic when wet; few, fine, fibrous roots in cracks; many fine pores; thin clay films in cracks; common particles of weatherable material from the C horizon; strongly acid; abrupt, irregular boundary.

C—29 to 35 inches +, mottled strong-brown and yellowish-red weathered granite or gneiss that has a texture of clay loam; massive; friable when moist; strongly acid. This layer contains common pieces of weathered feldspar.

The Ap horizon ranges from 4 to 15 inches in thickness and from grayish brown to yellowish brown in color. The B horizons range from 8 inches to 30 inches in total thickness and from clay to sandy clay in texture. The color of the Bt horizons ranges from yellowish brown to yellowish red of 10YR

and 5YR hues, and those horizons are mottled with brown and red. The combined thickness of the A horizon and B horizons ranges from 20 inches to 40 inches. Depth to hard rock is generally more than 4 feet and is commonly more than 10 feet.

Vance soils occur with Appling, Wedowee, Enon, and Helena soils. They are firmer when moist and are more plastic when wet than are the Appling and Wedowee soils. Vance soils are more acid and less brownish than the Enon soils and are better drained than the Helena soils.

Vance sandy loam, 2 to 6 percent slopes (VaB).—This soil is on smooth interstream divides in the uplands. The surface layer is grayish-brown to yellowish-brown sandy loam 7 to 15 inches thick. The subsoil is 8 to 30 inches thick and consists of yellowish-brown to yellowish-red, very firm clay to sandy clay, with common mottles of red (fig. 9).

Infiltration is good, but permeability is slow and surface runoff is medium. The hazard of erosion is moderate. This soil is easy to keep in good tilth, but tillage is sometimes delayed after heavy rains because of the slowly permeable subsoil.

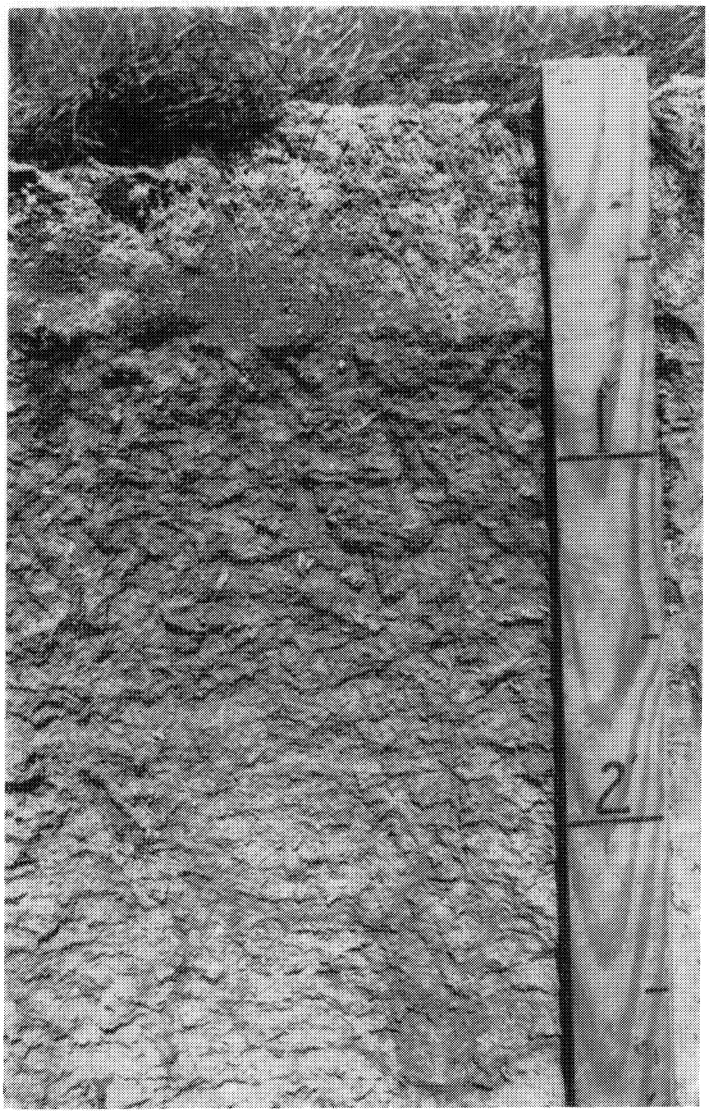

Figure 9.—Profile of a Vance sandy loam. In this soil the subsoil is clay that is very firm when moist and very plastic when wet.

About two-thirds of the acreage is cultivated or in pasture, and the rest is in forest. This soil is well suited to most of the locally grown crops, but the cultivated areas are used chiefly for row crops. Practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIe–3, woodland suitability group 11, wildlife suitability group 1)

Vance sandy loam, 2 to 6 percent slopes, eroded (VaB2).—This soil is on smooth interstream divides in the uplands. The surface layer is 4 to 7 inches thick. The subsoil is 8 to 30 inches thick and consists of yellowish-brown to yellowish-red, very firm clay to sandy clay that has common mottles of red.

Included with this soil in mapping were some severely eroded spots where the subsoil is exposed. These areas make up from 5 to 25 percent of the acreage in the mapping unit.

Infiltration is fair, but permeability is slow and surface runoff is medium. The hazard of further erosion is moderate. This soil is difficult to keep in good tilth, and tillage is restricted after heavy rains because of the slowly permeable subsoil. A crust forms on the severely eroded spots after hard rains, and clods form if those areas are worked when wet. The crust and the clods interfere with germination. As a result, stands of crops are poor and replanting of those areas may be necessary. An even stand of tobacco is hard to obtain. Plants in an uneven stand mature at different times, which makes harvesting and curing difficult and reduces the quality of the tobacco.

About two-thirds of the acreage is cultivated or in pasture, and the rest is in forest. This soil is well suited to most of the locally grown crops, but the cultivated areas are used chiefly for row crops. Practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIe–3, woodland suitability group 11, wildlife suitability group 1)

Vance sandy loam, 6 to 10 percent slopes, eroded (VaC2).—This soil is on narrow side slopes in the uplands. Where erosion is moderate, the surface layer ranges from brown to yellowish brown in color, from sandy loam to sandy clay in texture, and from 4 to 6 inches in thickness. Where erosion is only slight, the surface layer is grayish-brown to yellowish-brown sandy loam 6 to 12 inches thick. The subsoil is 8 to 30 inches thick and consists of yellowish-brown to yellowish-red, very firm clay to sandy clay, with common mottles of red. In some places some severely eroded spots where the subsoil is exposed were included with this soil in mapping.

Infiltration is fair to good, but permeability is slow and surface runoff is rapid. The hazard of further erosion is severe. Where this soil is only slightly eroded, it is easy to keep in good tilth. Where it is moderately eroded, it is difficult to keep in good tilth. Because of the slowly permeable subsoil, tillage is restricted after heavy rains. A crust forms on the severely eroded spots after hard rains, and clods form if those areas are worked when wet. The crust and the clods interfere with germination. As a result, stands of crops are poor and replanting of those areas is sometimes necessary. An even stand of tobacco is hard to obtain. Plants in an uneven stand

mature at different times, which makes harvesting and curing of the crop difficult and reduces the quality of the tobacco.

This soil is well suited to most of the crops grown locally. Where it is cultivated, it is used chiefly for row crops. About one-third of the acreage is cultivated or in pasture, and the rest is in forest. Intensive practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIIe–3, woodland suitability group 11, wildlife suitability group 1)

Wagram Series

The Wagram series consists of nearly level to sloping, very deep, somewhat excessively drained soils that occupy large areas on Coastal Plain uplands in the southern part of the county. These soils are on side slopes and on broad, smooth, rounded divides where the difference in elevation is about 20 feet between the highest and the lowest points. They have formed under forest in Coastal Plain sediment. The water table remains below the solum.

Natural fertility and the content of organic matter are low or very low, and permeability is moderate. The available water capacity and the shrink-swell potential are low. Except in areas that have received lime, these soils are medium acid to very strongly acid. Response is good if suitable applications of lime and fertilizer are made.

The Wagram soils of Wake County are moderately important for farming. Most of the acreage is cultivated, but part of it is in pasture or forest.

Representative profile of a Wagram loamy sand in a cultivated field one-half mile north of the line between Wake and Johnston Counties, 1¼ miles south of Little Black Creek, and 100 yards south of a paved road:

Ap—0 to 8 inches, grayish-brown (10YR 5/2) loamy sand; weak, coarse, granular structure; very friable when moist; many fine, fibrous roots; medium acid; abrupt, smooth boundary.

A2—8 to 25 inches, pale-brown (10YR 6/3) loamy sand; few, medium, distinct, yellow mottles; weak, coarse, granular structure; very friable when moist; common, fine, fibrous roots in uppermost 4 inches; medium acid; clear, wavy boundary.

B1—25 to 31 inches, brownish-yellow (10YR 6/8) sandy loam; weak, medium and coarse, subangular blocky structure; very friable when moist, slightly sticky and slightly plastic when wet; medium acid; clear, wavy boundary.

B21t—31 to 39 inches, yellowish-brown (10YR 5/8) sandy clay loam; weak, medium and coarse, subangular blocky structure; friable when moist, sticky and slightly plastic when wet; few, thin, discontinuous clay films; few fine pores; strongly acid; clear, wavy boundary.

B22t—39 to 45 inches, yellowish-brown (10YR 5/8) sandy clay loam; common, fine, distinct, reddish-yellow mottles; weak, medium, subangular blocky structure; friable when moist, sticky and slightly plastic when wet; thin, discontinuous clay films; few, red, soft nodules; strongly acid; gradual, wavy boundary.

B31t—45 to 65 inches, brownish-yellow (10YR 6/6) sandy clay loam; common, medium, distinct mottles of yellowish brown, red, and light gray; moderate, medium, subangular blocky structure; friable when moist, sticky and slightly plastic when wet; medium, discontinuous clay films; very strongly acid; abrupt, smooth boundary.

IIB32—65 to 73 inches, mottled brownish-yellow (10YR 6/6), yellowish-brown (10YR 5/8), red (2.5YR 5/8), and light-gray (10YR 7/2) clay; moderate, fine, angular blocky structure; very firm when moist, sticky and plastic when wet; few thin clay films; very strongly acid; clear, smooth boundary.

IIC—73 to 100 inches +, coarsely mottled, light-gray (10YR 7/1), dark-red (10R 3/6), and yellowish-brown (10YR 5/8) clay; massive; very firm when moist, sticky and plastic when wet; very strongly acid.

The A horizons range from 20 to 40 inches in combined thickness, from dark grayish brown or grayish brown to pale yellow in color, and from loamy sand to sand in texture. The B horizons range from yellowish brown or brownish yellow to reddish yellow in color and from 30 to more than 60 inches in combined thickness. The texture of the B horizons ranges from sandy loam and sandy clay loam to clay. The combined thickness of the A horizons and B horizons is more than 60 inches. Depth to hard rock is generally more than 20 feet.

Wagram soils occur with Norfolk and Troup soils. They have a thicker surface layer than the Norfolk soils and a thinner surface layer than the Troup.

Wagram loamy sand, 0 to 2 percent slopes (WaA).—This soil is on broad, flat interstream divides in the uplands. The surface layer is dark grayish-brown to pale-yellow loamy sand 20 to 40 inches thick. The subsoil is yellowish-brown to reddish-yellow, friable sandy loam to sandy clay loam 30 to 60 inches or more thick. In many places this soil contains an incipient and discontinuous horizon, with plinthite.

Infiltration is good, and surface runoff is slow. This soil is easy to keep in good tilth and can be worked throughout a wide range of moisture content. The thick, sandy surface layer makes it droughty, however, and subject to leaching.

Practically all of the acreage is cultivated, but a small acreage is in forest. This soil is fairly well suited to most of the locally grown crops, but the cultivated areas are used chiefly for row crops, especially tobacco. Moderately intensive practices that effectively conserve moisture and that restrict leaching are needed in the areas used for crops. (Capability unit IIs–1, woodland suitability group 9, wildlife suitability group 4)

Wagram loamy sand, 2 to 6 percent slopes (WaB).—This soil is on broad, smooth interstream divides in the uplands. The surface layer is dark grayish-brown to pale-yellow loamy sand 20 to 40 inches thick. The subsoil is yellowish-brown to reddish-yellow, friable sandy loam to sandy clay loam 30 to 60 inches or more thick. In many places this soil contains an incipient and discontinuous horizon, with plinthite.

Infiltration is good, and surface runoff is medium. The hazard of erosion is moderate. This soil is easy to keep in good tilth and can be worked throughout a wide range of moisture content. The thick, sandy surface layer makes it droughty, however, and it is subject to leaching.

Practically all of the acreage is cultivated, but a small acreage is in forest. This soil is fairly well suited to most of the locally grown crops, but it is used chiefly for row crops, especially tobacco. Moderately intensive practices that effectively conserve moisture and restrict leaching are needed. Practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIs–1, woodland suitability group 9, wildlife suitability group 4)

Wagram loamy sand, 6 to 10 percent slopes (WaC).—This soil is on narrow side slopes in the uplands. The surface layer is dark grayish-brown to pale-yellow loamy sand 20 to 40 inches thick. The subsoil is yellowish-brown to reddish-yellow, friable sandy loam to sandy clay loam 30 to 60 inches or more thick. In many places this soil contains an incipient and discontinuous horizon, with plinthite. Included with this soil in mapping were some areas where the slope is between 10 and 15 percent.

Infiltration is good, and surface runoff is rapid. The hazard of erosion is severe. This soil is easy to keep in good tilth and can be worked throughout a wide range of moisture content. The thick, sandy surface layer makes the soil droughty, however, and subject to leaching of mobile plant nutrients.

About three-fourths of the acreage is cultivated or in pasture, and the rest is in forest. This soil is fairly well suited to most of the locally grown crops, and the cultivated areas are used chiefly for row crops, especially tobacco. Intensive practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIIe–5, woodland suitability group 9, wildlife suitability group 4)

Wagram-Troup sands, 0 to 4 percent slopes (WgA).—The soils in this soil complex are so intricately mixed that the areas cannot be shown separately on a map of the scale used. About 60 percent of a typical mapped area is Wagram sand, 30 percent is Troup sand, and about 10 percent consists of other Wagram soils, Norfolk soils, and similar soils.

The Wagram sand has a surface layer that is dark grayish brown to pale yellow and is 20 to 40 inches thick. The subsoil is yellowish-brown to strong-brown, friable sandy loam to sandy clay loam 30 to 60 inches thick.

The Troup soil has a surface layer of dark grayish-brown to light yellowish-brown sand 40 to 60 inches thick. The subsoil is yellowish-brown to strong-brown, friable sandy loam to clay loam 30 to 72 inches or more thick.

In both soils infiltration is good. Surface runoff is medium to slow. These soils are easy to keep in good tilth and can be worked throughout a wide range of moisture content. The thick, sandy surface layer makes them droughty, however, and subject to severe leaching of mobile plant nutrients.

About two-thirds of the acreage is cultivated, and the rest is in forest. The soils are fairly well suited to most of the locally grown crops, though returns are generally not high. Most of the acreage that is cultivated is used for row crops. Intensive practices that effectively conserve moisture and that protect the soils from leaching are needed in the cultivated areas. (Capability unit IIIs–1, woodland suitability group 10, wildlife suitability group 4)

Wahee Series

The Wahee series consists of nearly level, deep, somewhat poorly drained soils on low stream terraces. These soils occupy large and small areas near the major streams in the county. They have formed under forest in alluvial deposits. A seasonally high water table is at a depth of about 1½ feet.

Natural fertility is medium, and the content of organic matter is low. Permeability is slow, the available water capacity is medium, and the shrink-swell potential is moderate. Flooding is frequent, but the floodwaters remain for only a short time. Except in areas that have received lime, these soils are strongly acid. Response is fairly good if suitable applications of lime and fertilizer are made.

The Wahee soils of Wake County are not important for farming. Most of the acreage is in forests of mixed hardwoods, but a small acreage is in pasture or is cultivated.

Representative profile of Wahee fine sandy loam in a recently cleared field 1.3 miles southwest of Plymouth Church on a farm road and 135 yards north of the end of the farm road:

Ap—0 to 6 inches, dark grayish-brown (10YR 4/2) fine sandy loam; weak, medium, granular structure; very friable when moist; many fine and medium, fibrous roots; common fine pores; slightly acid; abrupt, smooth boundary.

B1—6 to 14 inches, yellowish-brown (10YR 5/8) light fine sandy clay loam; few, fine, distinct, gray mottles; weak, medium, subangular blocky structure; friable when moist, slightly sticky and slightly plastic when wet; common, fine, fibrous roots; few fine pores; strongly acid; gradual, wavy boundary.

B2t—14 to 36 inches, yellowish-brown (10YR 5/8) clay; common, medium, distinct, gray mottles and few, fine, prominent, yellowish-red mottles; strong, medium and coarse, angular blocky structure; very firm when moist, sticky and plastic when wet; few, fine, woody and fibrous roots; few fine pores; thick, medium clay films on ped surfaces; thin layers of fine sandy material in vertical cracks; strongly acid; gradual, irregular boundary.

B3—36 to 45 inches +, mottled gray (10YR 6/1) and yellowish-brown (10YR 5/8) fine sandy clay loam that contains pockets of gray (10YR 6/1) heavy sandy clay; friable when moist, sticky and slightly plastic when wet; few, fine, woody roots; medium acid.

The A horizon ranges from 4 to 10 inches in thickness and from dark grayish brown to pale olive in color. The B horizons range from 39 to 70 inches in combined thickness and from fine sandy clay loam to clay in texture. The color of the B horizons is yellowish brown mottled with yellowish or gray mottles of 5Y, 2.5Y, and 10YR hues. The gray colors increase with increasing depth until the soil material is mostly gray or is entirely gray. The lower boundary of the B2t horizon commonly separates that horizon from a stone line, sand, or unconsolidated sand and clay. The thickness of the solum ranges from 24 to more than 45 inches. Depth to hard rock is more than 5 feet and is commonly more than 15 feet.

Wahee soils occur with Augusta, Altavista, and Roanoke soils. They have a finer textured subsoil than the Augusta and Altavista soils. Wahee soils are more poorly drained than the Altavista soils but are better drained than the Roanoke soils.

Wahee fine sandy loam (0 to 2 percent slopes) (Wh).—This is the only Wahee soil mapped in Wake County. It is on low stream terraces. The surface layer is dark grayish-brown to pale-olive fine sandy loam 4 to 10 inches thick. The subsoil is yellowish-brown fine sandy clay loam to clay mottled with gray and is 39 to 70 inches thick. Included with this soil in mapping were some areas where the slope is between 2 and 4 percent.

Infiltration is good, and surface runoff is slow to ponded. If this soil has been drained, it is easy to keep in good tilth. Because of a slowly permeable subsoil, however, tillage can be performed within only a fairly narrow range of moisture content.

Most of the acreage is in forest, but a small acreage is in pasture or is cultivated. Where this soil is properly drained, it is fairly well suited to pasture, hay, and some row crops. Wetness and the slowly permeable subsoil are the main limitations to use for crops. Drainage of this soil is difficult. Nevertheless, if cultivated crops are to be grown, a complete system of surface and subsurface drainage is needed. (Capability unit IIIw–2, woodland suitability group 4, wildlife suitability group 2)

Wake Series

The Wake series consists of gently sloping to moderately steep, somewhat excessively drained soils that are very shallow over hard rock. These soils occupy rather large areas on Piedmont uplands, primarily in the northeastern part of the county. They are on side slopes and on rounded divides where the difference in elevation is about 50 feet between the highest and the lowest points. The soils have formed under forest in material that weathered from granite, gneiss, and other acidic rocks. The water table remains below the solum.

Natural fertility and the content of organic matter are low. Permeability is moderately rapid, the available water capacity is very low, and the shrink-swell potential is low. Except in areas that have received lime, these soils are strongly acid. Response is fairly good if suitable applications of lime and fertilizer are made.

In this county Wake soils are not important for farming. Most of the acreage is in forest.

Representative profile of a Wake gravelly loamy sand, 1.4 miles east of Wake Crossroads on county road No. 2224, 0.15 of a mile south on a private road, in a small cultivated field south of the road:

Ap—0 to 6 inches, brown (10YR 5/3) gravelly loamy sand; single grain; loose when moist or dry; contains many coarse quartz sand particles and many feldspar particles; strongly acid; abrupt, wavy boundary.

C—6 to 15 inches, yellow (10YR 7/6) loamy sand; single grain; loose when moist or dry; contains common fine pebbles and many feldspar particles; strongly acid; clear, wavy boundary.

R—15 inches +, light-colored granite that is high in content of quartz.

The color of the surface layer ranges from brown or very dark grayish brown to light yellowish brown. The color of the C horizon ranges from yellow to yellowish brown. In places the C horizon contains particles of unweathered feldspar, mica, and other dark minerals, as well as particles of quartz. In places the texture throughout the profile is gravelly loamy sand instead of loamy sand. Depth to hard rock is only 20 inches or less.

Wake soils occur with Louisburg soils. They are shallower over bedrock than are the Louisburg soils.

Wake soils, 2 to 10 percent slopes (WkC).—These soils are on small ridges and side slopes in the uplands. They have a surface layer of very dark grayish-brown to light yellowish-brown loamy sand or gravelly loamy sand 2 to 10 inches thick. Beneath the surface layer is yellow to yellowish-brown loamy sand 0 to 14 inches thick.

Infiltration is good, and surface runoff is medium to rapid. The hazard of erosion is very severe. These soils are easy to keep in good tilth and can be worked throughout a wide range of moisture content. The coarse texture and the bedrock near the surface make the soils very droughty during dry seasons. Leaching of mobile plant nutrients takes place during rainy seasons.

Most of the acreage is in forest, but some of it is cultivated or in pasture. These soils are suited to only a few of the locally grown crops. Very intensive practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IVe–3, woodland suitability group 12, wildlife suitability group 4)

Wake soils, 10 to 25 percent slopes (WkE).—These soils are on side slopes bordering drainageways in the uplands. Their surface layer is very dark grayish-brown to light yellowish-brown loamy sand or gravelly loamy sand 2 to 10 inches thick. It is underlain by yellow to yellowish-brown loamy sand 0 to 10 inches thick.

Infiltration is good. Surface runoff is very rapid.

Because of bedrock near the surface and slopes, these soils should be kept in forest. They are not suitable for cultivation. (Capability unit VIIe–1, woodland suitability group 12, wildlife suitability group 4)

Wedowee Series

The Wedowee series consists of gently sloping to moderately steep soils that are deep and well drained. These soils are on Piedmont uplands, mostly in the northeastern part of the county, but some scattered areas are in other parts. They are on side slopes and on rounded divides where the difference in elevation is about 50 feet between the highest and the lowest points. The soils have formed under forest in material that weathered from granite, gneiss, and other acidic rocks. The water table remains below the solum.

Natural fertility and the content of organic matter are low, permeability is moderate, and the available water capacity is medium. The shrink-swell potential is moderate. Except in areas that have received lime, these soils are strongly acid. Response is good if suitable applications of lime and fertilizer are made.

The Wedowee soils of Wake County are important for farming. Much of the acreage is cultivated or in pasture, but part of it is in forest or in other uses.

Representative profile of a Wedowee sandy loam in a cultivated field one-half mile north and one-fourth mile west of the Lockhart School on a paved road, 1 mile north on a gravel road, and 10 yards east of road:

Ap—0 to 7 inches, brown (10YR 5/3) sandy loam; weak, fine and medium, granular structure; very friable when moist; many fine, fibrous roots; many fine pores; few fine mica flakes; medium acid; abrupt, wavy boundary.

B21t—7 to 12 inches, strong-brown (7.5YR 5/6) clay loam; weak, fine and medium, subangular blocky structure; firm when moist, sticky and slightly plastic when wet; common, fine, fibrous roots; common fine pores; thick clay films on most ped surfaces; few fine mica flakes; strongly acid; abrupt, smooth boundary.

B22t—12 to 18 inches, yellowish-red (5YR 5/6) clay loam; common, medium, faint, reddish-yellow mottles; moderate, medium and fine, subangular blocky structure; friable when moist, sticky and slightly plastic when

wet; few, fine, fibrous roots; few fine pores; thick clay films on most ped surfaces; few fine mica flakes; strongly acid; clear, smooth boundary.

B3t—18 to 24 inches, yellowish-red (5YR 5/6) sandy clay loam; few, fine, prominent, brownish-yellow mottles; moderate, coarse, subangular blocky structure; friable when moist, slightly sticky and slightly plastic when wet; thick, continuous, reddish-brown (5YR 4/4) clay films that are more strongly developed on vertical surfaces than in other places; common fine pores; common fine mica flakes; strongly acid; clear, smooth boundary.

C—24 to 40 inches +, mottled brownish-yellow (10YR 6/8), yellowish-red (5YR 5/6), and red (2.5YR 5/8) sandy loam; massive; friable when moist; many fine mica flakes; strongly acid.

The A horizon ranges from 3 to 12 inches in thickness and from pale brown or brown to dark grayish brown of 10YR hue in color. The Bt horizons range from 8 to 30 inches in combined thickness and from sandy clay loam to clay loam in texture. The color of the Bt horizons ranges from yellowish brown to yellowish red of 10YR to 5YR hues, and typically those horizons are mottled with red and yellow. In places the B3 horizon is streaked with yellow and gray. The combined thickness of the A horizon and B horizons ranges from 20 to 37 inches. Depth to hard rock is generally more than 4 feet and is commonly more than 6 feet.

Wedowee soils occur with the Appling, Louisburg, and Vance soils. The combined thickness of their surface layer and subsoil is less than that of the Appling soils, and they have a finer textured subsoil than the Louisburg soils. The Wedowee soils have a more friable subsoil than the Vance soils.

Wedowee sandy loam, 2 to 6 percent slopes (WmB).—This soil is on smooth interstream divides in the uplands. The surface layer is pale-brown or brown to dark grayish-brown sandy loam 6 to 12 inches thick. The subsoil is yellowish-brown to yellowish-red, firm sandy clay loam to clay loam 8 to 30 inches thick. The subsoil contains common mottles of red or yellow. Included with this soil in mapping were some areas where from 20 to 50 percent of the surface layer is covered with gravel and from 20 to 50 percent of the surface layer consists of gravel.

Infiltration is good, and surface runoff is medium. The hazard of erosion is moderate. This soil is easy to keep in good tilth and can be worked throughout a wide range of moisture content.

About two-thirds of the acreage is cultivated or in pasture, and the rest is in forest or in other uses. The cultivated areas are used mainly for row crops, but this soil is fairly well suited to most of the other locally grown crops. Intensive practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIe–1, woodland suitability group 5, wildlife suitability group 1)

Wedowee sandy loam, 2 to 6 percent slopes, eroded (WmB2).—This soil is on smooth interstream divides in the uplands. It has a surface layer that is 3 to 7 inches thick. In many places the surface layer is a mixture of the remaining original surface soil and of material from the subsoil. In the less eroded areas, the surface layer is pale-brown to grayish-brown sandy loam, but the color ranges to brown and the texture ranges to sandy clay loam in the more eroded spots. The subsoil is 8 to 30 inches thick and consists of yellowish-brown to yellowish-red, firm sandy clay loam to clay loam, with common mottles of red or yellow.

Included with this soil in mapping were some areas in which from 20 to 50 percent of the surface layer is gravel. Also included were some severely eroded spots where the subsoil is exposed. The severely eroded spots make up from 5 to 25 percent of the acreage in the mapping unit.

Infiltration is fair, and surface runoff is medium. The hazard of further erosion is moderate. This soil is difficult to keep in good tilth, but it can be worked throughout a fairly wide range of moisture content. A crust forms on the severely eroded spots after hard rains, and clods form if those areas are worked when wet. The crust and the clods interfere with germination. As a result, stands of crops are poor and replanting of those areas may be necessary. An even stand of tobacco is hard to obtain. Plants in an uneven stand mature at different times. This makes harvesting and curing of the crop difficult and reduces the quality of the tobacco.

About two-thirds of the acreage is cultivated or in pasture, and the rest is in forest or in other uses. The cultivated areas are used chiefly for row crops, but this soil is fairly well suited to most of the other locally grown crops. Intensive practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIe–1, woodland suitability group 5, wildlife suitability group 1)

Wedowee sandy loam, 6 to 10 percent slopes (WmC).—This soil is on side slopes in the uplands. It has a surface layer of pale-brown and brown to dark grayish-brown sandy loam 6 to 10 inches thick. The subsoil is 8 to 26 inches thick and consists of yellowish-brown to yellowish-red, firm sandy clay loam to clay loam, with common mottles of red or yellow. Included with this soil in mapping where some areas where from 20 to 50 percent of the surface is covered with gravel and from 20 to 50 percent of the surface layer consists of gravel.

Infiltration is good, and surface runoff is rapid. The hazard of erosion is severe. This soil is easy to keep in good tilth, and it can be worked throughout a wide range of moisture content.

About one-third of the acreage is cultivated or in pasture, and the rest is in forest or in other uses. The cultivated areas are used chiefly for row crops, but this soil is fairly well suited to most of the locally grown crops. Intensive practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIIe–1, woodland suitability group 5, wildlife suitability group 1)

Wedowee sandy loam, 6 to 10 percent slopes, eroded (WmC2).—This soil is on side slopes in the uplands. The surface layer is 3 to 7 inches thick. In many places it is a mixture of the remaining original surface soil and of material from the subsoil. In the less eroded areas, the surface layer is pale-brown to grayish-brown sandy loam, but the color ranges to brown and the texture ranges to sandy clay loam in the more eroded spots. The subsoil is 8 to 26 inches thick and consists of yellowish-brown to yellowish-red, firm sandy clay loam or clay loam, with common mottles of red or yellow.

Included with this soil in mapping were some areas where from 20 to 50 percent of the surface is covered with gravel and from 20 to 50 percent of the surface

layer consists of gravel. Also included were some severely eroded spots where the subsoil is exposed. The severely eroded spots make up from 5 to 25 percent of the acreage in the mapping unit.

Infiltration is fair, and surface runoff is rapid. The hazard of further erosion is severe. This soil is difficult to keep in good tilth, but it can be worked throughout a fairly wide range of moisture content. A crust forms on the severely eroded spots after hard rains, and clods form if those areas are worked when wet. The crust and the clods interfere with germination. As a result, stands of crops are poor and replanting of the severely eroded spots may be necessary. An even stand of tobacco is hard to obtain. Plants in an uneven stand mature at different times. This makes harvesting and curing of the crop difficult and reduces the quality of the tobacco.

About one-third of the acreage is cultivated or in pasture, and the rest is in forest or in other uses. Where this soil has been cleared, it is used chiefly for row crops, but it is fairly well suited to most of the locally grown crops. Intensive practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIIe–1, woodland suitability group 5, wildlife suitability group 1)

Wedowee sandy loam, 10 to 15 percent slopes, eroded (WmD2).—This soil is on narrow side slopes bordering drainageways in the uplands. In most places it is moderately eroded, but it is only slightly eroded in some areas. In the moderately eroded areas, the surface layer is pale-brown and grayish-brown sandy loam to brown sandy clay loam 3 to 6 inches thick. In the slightly eroded areas, the surface layer is pale-brown and brown to dark grayish-brown sandy loam 6 to 8 inches thick. The subsoil is 8 to 24 inches thick and consists of yellowish-brown to yellowish-red, firm sandy clay loam or clay loam, with common mottles of red or yellow.

Included with this soil in mapping were some areas where from 20 to 50 percent of the surface is covered with gravel and from 20 to 50 percent of the surface layer consists of gravel. Also included were some severely eroded spots where the subsoil is exposed. Other inclusions consist of a few areas of Vance soils in which the subsoil is firmer than typical for the Wedowee soils.

Infiltration is fair to good, and surface runoff is very rapid. The hazard of further erosion is very severe. Where erosion is only slight, this soil is easy to keep in good tilth. Where erosion is moderate, the soil is difficult to keep in good tilth. This soil can be worked throughout a fairly wide range of moisture content. A crust forms on the severely eroded spots after hard rains, however, and clods form if those areas are worked when wet. The crust and the clods interfere with germination. As a result, stands of crops are poor and replanting of the severely eroded spots may be necessary.

Most of the acreage is in forest, but some of it is cultivated or in pasture. Where this soil has been cleared, the acreage that is cultivated is used chiefly for row crops, but this soil is fairly well suited to most of the locally grown crops. Very intensive practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IVe–1, woodland suitability group 5, wildlife suitability group 1)

Wedowee sandy loam, 15 to 25 percent slopes (WmE).—This is a slightly to moderately eroded soil on narrow side slopes bordering the major drainageways in the uplands. In the slightly eroded areas, the surface layer is pale-brown and brown to dark grayish-brown sandy loam 6 to 8 inches thick. In the moderately eroded areas, the surface layer ranges from pale-brown and grayish-brown sandy loam to brown sandy clay loam and is 3 to 6 inches thick. The subsoil is 8 to 20 inches thick and consists of yellowish-brown to yellowish-red, firm sandy clay loam to clay loam, with common mottles of red or yellow.

Included with this soil in mapping were some areas where from 20 to 50 percent of the surface is covered with gravel and from 20 to 50 percent of the surface layer consists of gravel. Also included were some severely eroded spots where the subsoil is exposed, and other areas where the slopes range from 25 to 45 percent.

Infiltration is good to fair, and surface runoff is very rapid. This soil is highly susceptible to further erosion.

Practically all of the acreage is in forest. Where this soil has been cleared, however, it should be used for pasture and permanent hay. This soil is not suitable for cultivated crops, because of the moderately steep slopes and susceptibility to erosion. (Capability unit VIe–1, woodland suitability group 5, wildlife suitability group 1)

Wehadkee Series

The Wehadkee series consists of nearly level, poorly drained soils on the flood plains of most of the streams in the county. These soils have formed in fine loamy alluvial material. They have a seasonal high water table approximately at the surface.

Natural fertility is low, and the content of organic matter is medium. Permeability is moderate to moderately rapid, the available water capacity is medium, and the shrink-swell potential is low. Flooding is frequent, and the floodwaters remain for a long time. Unless lime has been applied, reaction is strongly acid or very strongly acid. Response is fairly good if suitable applications of lime and fertilizer are made.

Wehadkee soils are not important for farming. Most of the acreage is in mixed hardwoods and a few pines, but a small acreage is in pasture.

Representative profile of Wehadkee silt loam in a wooded area 1¼ miles east of the Wakefield Church on county road No. 2320, three-fourths of a mile north on county road No. 2341, and 200 feet west of road:

O1—layer of thinly scattered hardwood leaves, not thick enough to measure.

A1—0 to 6 inches, dark grayish-brown (10YR 4/2) silt loam; common, medium, faint, grayish-brown mottles and common, fine, distinct, yellowish-red mottles; the yellowish-red mottles appear to be stains of organic matter in root channels; moderate, medium, granular structure; very friable when moist; many fine and medium, woody roots; many fine pores; strongly acid; abrupt, smooth boundary.

B21g—6 to 10 inches, gray (10YR 5/1) silty clay loam; common, fine, prominent, strong-brown mottles; weak, medium and fine, subangular blocky structure; friable when moist, slightly sticky and slightly plastic

when wet; many fine, woody roots; many fine pores; strongly acid; clear, smooth boundary.

B22g—10 to 20 inches, dark-gray (10YR 4/1) fine sandy clay loam; few, medium, prominent, strong-brown mottles; weak, medium, subangular blocky structure; friable when moist; slightly sticky and slightly plastic when wet; common, fine, woody roots; many fine pores; strongly acid; clear, smooth boundary.

B23g—20 to 30 inches, gray (10YR 5/1) sandy clay loam; massive; friable when moist, slightly sticky and slightly plastic when wet; few fine pores; few, small, rounded pebbles; strongly acid; abrupt, smooth boundary.

Cg—30 to 40 inches +, mottled gray and dark-gray sandy loam; massive; very friable when moist, slightly sticky and slightly plastic when wet; common fine mica flakes; few, fine, rounded quartz pebbles; strongly acid.

The A1 horizon ranges from dark grayish brown to brown in color and from 3 to 12 inches in thickness. The color of the B horizons ranges from gray to dark gray of 10YR hue, and the combined thickness of those horizons ranges from 15 to 30 inches. In general, the texture of the B horizons ranges from sandy loam to silty clay loam or sandy clay loam. In places, however, the texture in parts of the B horizons is sand. The soil material in those areas is massive or has subangular blocky structure. Thickness of the solum ranges from 20 to 40 inches. Depth to hard rock ranges from 3 to 15 or more feet.

Wehadkee soils occur with Chewacla, Roanoke, and Bibb soils. They are more poorly drained than the Chewacla soils, have a coarser textured subsoil than the Roanoke soils, and have a finer textured subsoil than the Bibb soils.

Wehadkee silt loam (0 to 2 percent slopes) (Wn).—This is a poorly drained soil on the flood plains of streams. It has a surface layer of dark grayish-brown to brown silt loam 3 to 12 inches thick. The subsoil is gray to dark-gray, friable sandy loam to silty clay loam or sandy clay loam. It is commonly mottled with strong brown and yellowish brown and is 15 to 30 inches thick.

Infiltration is good, and surface runoff is slow to ponded. Where this soil is drained, it is fairly easy to keep in good tilth and can be worked within a fairly wide range of moisture content.

This soil is fairly well suited to a few locally grown crops. It is mainly in forest, however, though a small acreage is in pasture. The soil is wet and is subject to overflow and ponding, which are very severe hazards. Adequate drainage is difficult to obtain, but surface and subsurface drainage are needed if cultivated crops are to be grown. (Capability unit IVw–1, woodland suitability group 2, wildlife suitability group 3)

Wehadkee and Bibb soils (0 to 4 percent slopes) (Wo).—The soils of this unit are poorly drained and are so similar in use and management that they were mapped together as an undifferentiated unit. Some areas consist entirely of Wehadkee soil, others consist of Bibb soil, and still others consist of a combination of Wehadkee, Bibb, and minor included soils. About 40 percent of a typical mapped area is Wehadkee soil, 30 percent is Bibb soil, and 30 percent in Chewacla, Mantachie, or other soils.

The Wehadkee soil has a surface layer of dark grayish-brown to brown silt loam 3 to 12 inches thick. Its subsoil is gray or dark-gray, friable sandy loam to silty clay loam 15 to 30 inches thick. In most places the subsoil is mottled with strong brown and yellowish brown.

The Bibb soil has a grayish-brown or very dark grayish-brown surface layer of sandy loam 4 to 12 inches thick. Its subsoil is varied in color and texture, but the colors range from light brownish gray to black mottled with gray and brown, and the texture ranges from loam to sandy loam. The combined thickness of their surface layer and subsoil is more than 36 inches.

The soils of this mapping unit are on flood plains, in narrow upland draws, and in depressions throughout the county. In those areas the stream channels are poorly defined. Where these soils are on flood plains along streams, they are wet, are subject to very frequent flooding of long duration, and have a water table at the surface for periods of as much as 6 months. The soils in draws are also wet and have a water table at the surface for periods of as much as 6 months. In those areas, however, flooding is of only short duration, though it is frequent. In many places the stream channels in the upland draws are well defined.

Surface runoff is slow to ponded. Infiltration is fair for the Wehadkee soil and good for the Bibb.

Nearly all of the acreage is in mixed hardwoods and pines. Flooding and ponding are very severe hazards. Adequate drainage of these wet soils is difficult to obtain, but both surface drainage and subsurface drainage are needed if cultivated crops are to be grown. (Capability unit IVw–1, woodland suitability group 2, wildlife suitability group 3)

White Store Series

The White Store series consists of gently sloping to moderately steep, moderately deep, moderately well drained soils on Piedmont uplands in the western part of the county. These soils are on rounded divides that have a difference in elevation of about 50 feet between the highest and the lowest points. They have formed under forest in material that weathered from sandstone, shale, and mudstone of Triassic age. The water table generally remains below the solum. Because of the slowly permeable subsoil, however, these soils have a perched water table during wet seasons.

Natural fertility and the content of organic matter are low, and permeability is slow. The available water capacity and the shrink-swell potential are high. Except in areas that have received lime, these soils are very strongly acid. Response is fairly good if suitable applications of lime and fertilizer are made.

The White Store soils of this county are mainly in forest. Some areas, however, are used for cultivated crops or pasture.

Representative profile of a White Store sandy loam in a wooded area one-fourth of a mile southwest of the line between Wake and Chatham Counties on U.S. Highway No. 1, 2 miles southeast on a gravel road to a five-points intersection, 1½ miles southwest on a gravel road, and 500 feet west of road:

Ap—0 to 6 inches, light yellowish-brown (10YR 6/4) sandy loam; weak, medium, granular structure; very friable when moist; many, fine, fibrous and few medium, woody roots; few small quartz pebbles; strongly acid; abrupt, smooth boundary.

B1—6 to 9 inches, yellowish-red (5YR 5/6) clay loam; moderate, fine, subangular blocky structure; friable when moist, sticky and plastic when wet; common, fine, fibrous and woody roots; few thin clay films; very strongly acid; clear, wavy boundary.

B21t—9 to 20 inches, reddish-brown (2.5YR 4/4) clay; strong, fine, angular blocky structure; very firm when moist, sticky and very plastic when wet; few, fine, woody roots; medium clay films; very strongly acid; clear, wavy boundary.

B22t—20 to 25 inches, dark reddish-brown (2.5YR 3/4) clay; common, fine, prominent, light-gray mottles; strong, medium, angular blocky structure; very firm when moist, sticky and very plastic when wet; thin clay films; few pockets of dark-red weathered shale; very strongly acid; clear, wavy boundary.

B3t—25 to 31 inches, dark-red (10R 3/6) clay; common, medium, prominent, light-gray mottles; weak, medium, angular blocky structure tending toward massive; very firm when moist, sticky and plastic when wet; thin clay films; common fragments of disintegrated shale; very strongly acid; clear, wavy boundary.

C1—31 to 35 inches, dusky-red sandy clay; disintegrated shale containing pockets of light-gray clay; very strongly acid; abrupt, wavy boundary.

R—35 inches +, dusky-red shale of Triassic age.

The Ap horizon ranges from 3 to 12 inches in thickness, from dark grayish brown or brown to light yellowish brown or red in color, and from sandy loam to silt loam or clay loam in texture. The B horizons range from 9 to 36 inches in combined thickness and have a texture mostly of clay that is very firm when moist and very plastic when wet. The clay cracks when the soils are dry. The color of the B horizons ranges from dusky red through yellowish red and strong brown to olive yellow in hues ranging from 10R to 2.5Y. In many places these soils are mottled with gray in the upper part of the B2t horizon. These soils have columnar structure when dry; have strong to weak, medium and coarse, angular blocky structure when moist; and are massive when wet. They have a high content of exchangeable aluminum. The combined thickness of the A horizon and B horizons ranges from 24 to more than 48 inches. Depth to hard rock is generally more than 3 feet and is commonly more than 8 feet.

White Store soils occur with Creedmoor and Mayodan soils. They lack the friable upper subsoil of the Creedmoor soils, however, and have a firmer subsoil than the Mayodan.

White Store sandy loam, 2 to 6 percent slopes (WsB).—This soil is on broad, smooth interstream divides in the uplands. It has a surface layer of dark grayish-brown and brown to light yellowish-brown sandy loam 6 to 12 inches thick. The subsoil is 9 to 36 inches thick. It consists of clay that is very firm when moist and very plastic when wet. The color of the subsoil is dusky red, yellowish red, strong brown, and olive yellow, with common mottles of gray. Included with this soil in mapping were some areas where the surface layer is coarse sandy loam and other areas where the surface layer is fine sandy loam.

Infiltration is good, but permeability is slow and surface runoff is medium. The hazard of erosion is moderate. This soil is easy to keep in good tilth, but tillage is restricted after heavy rains because of the slowly permeable subsoil.

This soil is fairly well suited to many of the locally grown crops. About one-third of the acreage is cultivated or in pasture, and the rest is in forest. The areas that have been cleared are used chiefly for row crops. This soil has a high content of exchangeable aluminum, which is toxic to some plants. Practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIe–3, woodland suitability group 11, wildlife suitability group 1)

White Store sandy loam, 2 to 6 percent slopes, eroded (WsB2).—This soil is on broad, smooth interstream divides in the uplands. The surface layer is 3 to 6 inches thick. In many places it is a mixture of the remaining original surface layer and of material from the subsoil. In the less eroded areas, the surface layer is brown to light yellowish-brown sandy loam, but the texture ranges to clay loam in the more eroded spots. The subsoil is dusky-red, yellowish-red, strong-brown, and olive-yellow clay, with common mottles of gray. It is very firm when moist and very plastic when wet.

Included with this soil in mapping were some areas of a soil that has a surface layer of coarse sandy loam, and other areas of a soil that has a surface layer of fine sandy loam. Also included were some severely eroded spots where the subsoil is exposed. These severely eroded areas make up from 5 to 25 percent of the acreage in the mapping unit.

Infiltration is fair, permeability is slow, and surface runoff is medium. The hazard of further erosion is severe. This soil is difficult to keep in good tilth. Because of the slowly permeable subsoil, tillage is restricted after heavy rains. A crust forms on the severely eroded spots after hard rains, and clods form if those areas are worked when wet. The crust and the clods interfere with germination. As a result, stands of crops are poor and replanting of the severely eroded spots may be necessary.

About one-third of the acreage is cultivated or in pasture, and the rest is in forest. This soil is fairly well suited to many of the locally grown crops, and the cultivated areas are used mainly for row crops. The soil contains a large amount of exchangeable aluminum, which is toxic to some plants. Intensive practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIIe–3, woodland suitability group 11, wildlife suitability group 1)

White Store sandy loam, 6 to 10 percent slopes (WsC).—This soil is on narrow side slopes in the uplands. It has a dark grayish-brown and brown to light yellowish-brown surface layer 5 to 10 inches thick. The subsoil color ranges from dusky red or yellowish red to strong brown and olive yellow, with common mottles of gray. The subsoil is clay that is very firm when moist and very plastic when wet and is 9 to 30 inches thick. Included with this soil in mapping were some areas of a soil that has a surface layer of coarse sandy loam, and other areas of a soil that has a surface layer of fine sandy loam.

Infiltration is good, permeability is slow, and surface runoff is rapid. The hazard of further erosion is severe. This soil is easy to keep in good tilth. Because of the slowly permeable subsoil, however, tillage is restricted after heavy rains.

About three-fourths of the acreage is in forest, and the rest is cultivated or in pasture. This soil is fairly well suited to many of the locally grown crops, and the areas that have been cleared are used chiefly for row crops. This soil contains a large amount of aluminum, which is toxic to some plants. Intensive practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIIe–3, woodland suitability group 11, wildlife suitability group 1)

White Store sandy loam, 6 to 10 percent slopes, eroded (WsC2).—This soil is on narrow side slopes in the uplands. Its surface layer is 3 to 6 inches thick. In many places the surface layer is a mixture of the remaining original surface soil and of material from the subsoil.

In the less eroded areas, the surface layer is brown to light-brown sandy loam, but the texture ranges to clay loam in the severely eroded spots. The color of the subsoil ranges from dusky red and yellowish red to strong brown and olive yellow, with common mottles of gray. The subsoil is clay that is very firm when moist and very plastic when wet and is 9 to 30 inches thick.

Included with this soil in mapping were some areas of a soil that has a surface layer of coarse sandy loam, and other areas of a soil that has a surface layer of fine sandy loam. In the severely eroded spots that are included, the subsoil is exposed. The severely eroded spots make up from 5 to 25 percent of the acreage in the mapping unit.

Infiltration is fair, permeability is slow, and surface runoff is rapid. The hazard of further erosion is very severe. This soil is difficult to keep in good tilth, and tillage is restricted after heavy rains because of the slowly permeable subsoil. A crust forms on the severely eroded spots after hard rains, and clods form if those areas are worked when wet. The crust and the clods interfere with germination. As a result, stands of crops are poor and replanting of the severely eroded areas may be necessary.

This soil is fairly well suited to many of the locally grown crops, and the areas that have been cleared are used chiefly for row crops. About three-fourths of the acreage is in forest, however, and the rest is cultivated or in pasture. This soil contains a large amount of exchangeable aluminum, which is toxic to some plants. Very intensive practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IVe–3, woodland suitability group 11, wildlife suitability group 1)

White Store sandy loam, 10 to 20 percent slopes (WsE).—This is a slightly eroded or moderately eroded soil on narrow side slopes bordering upland drainageways. Where erosion is only slight, the surface layer is dark grayish-brown to brown sandy loam 6 to 8 inches thick. Where erosion is moderate, the color of the surface layer ranges from light yellowish brown to brown, the texture ranges from sandy loam to clay loam, and the thickness ranges from 3 to 5 inches. The color of the subsoil ranges from dusky red and yellowish red to strong brown and olive yellow, with common mottles of gray. The subsoil is 9 to 24 inches thick and consists of clay that is very firm when moist and very plastic when wet.

Included with this soil in mapping were some areas of a soil that has a surface layer of fine sandy loam. Also included were a few severely eroded spots where the subsoil is exposed.

Infiltration is good to fair, permeability is slow, and surface runoff is very rapid. The steepness of the slope and the slowly permeable subsoil make this soil highly susceptible to further erosion.

This soil is not suited to cultivated crops, and practically all of the acreage is in forest. The areas that have been cleared should be kept in pasture or permanent hay. (Capability unit VIe–1, woodland suitability group 11, wildlife suitability group 1)

White Store silt loam, 2 to 6 percent slopes (WtB).—This is a slightly eroded or moderately eroded soil on broad, smooth interstream divides in the uplands. Where erosion is only slight, the surface layer is dark grayish-brown and grayish-brown silt loam 6 to 8 inches thick. Where erosion is moderate, the color of the surface layer ranges from light yellowish brown to brown, the texture ranges from silt loam to clay loam, and the thickness ranges from 3 to 6 inches. The color of the subsoil ranges from dusky red and yellowish red to strong brown and olive yellow, with common mottles of gray. The subsoil is 9 to 30 inches thick and consists of clay that is very firm when moist and very plastic when wet (fig. 10). Included with this soil in mapping were a few severely eroded spots where the subsoil is exposed.

Infiltration is good to fair, permeability is slow, and surface runoff is medium. The hazard of further erosion is moderate. Where erosion is only slight, this soil is easy to keep in good tilth, but where erosion is moderate, the soil is difficult to keep in good tilth. Because of the slowly permeable subsoil, tillage is restricted after hard rains. A crust forms on the severely eroded spots after hard rains, and clods form if those areas are worked when wet. The crust and the clods interfere with germi-

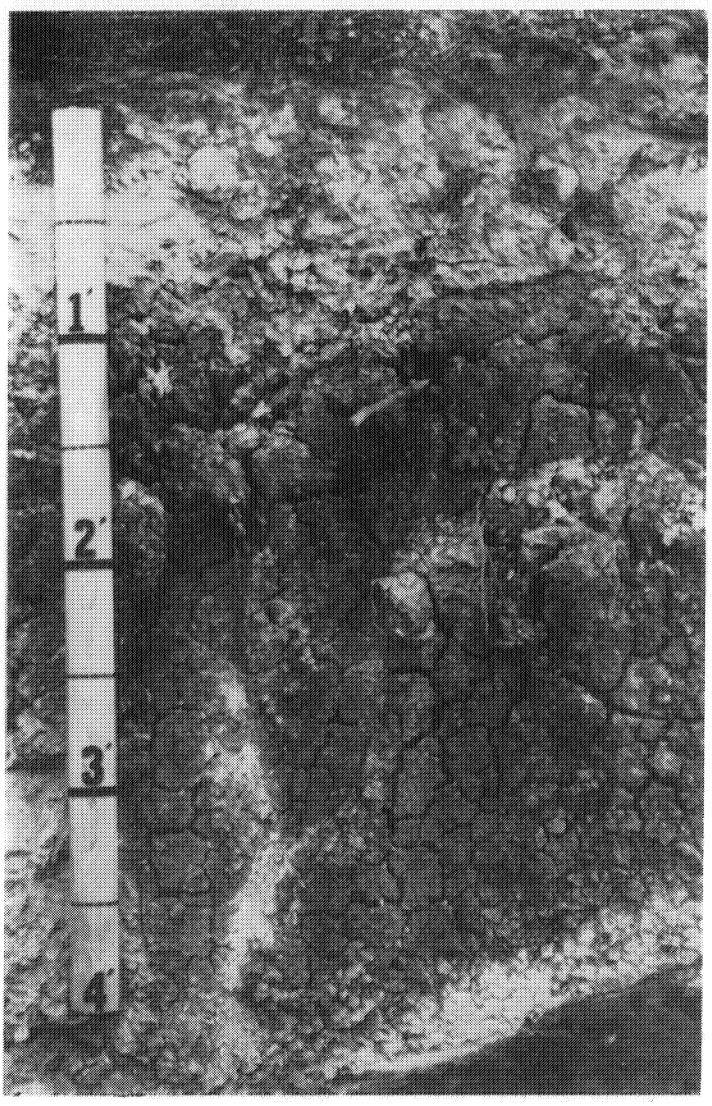

Figure 10.—**Profile of White Store silt loam, 2 to 6 percent slopes.**

nation. As a result, stands of crops are poor and replanting of the severely eroded spots may be necessary.

This soil is fairly well suited to many of the locally grown crops, and the areas that have been cleared are used for row crops and pasture. About three-fourths of the acreage is in forest, and the rest is cultivated or in pasture. This soil contains a large amount of exchangeable aluminum, which is toxic to some plants. Intensive practices that effectively control runoff and erosion are needed in the cultivated areas. (Capability unit IIe–3, woodland suitability group 11, wildlife suitability group 1)

White Store clay loam, 2 to 15 percent slopes, severely eroded (WvD3).—This soil is on Piedmont uplands. It has a red to brown clay loam surface layer 3 to 6 inches thick. The present surface layer is a mixture of the remaining original surface soil and of material from the subsoil. The color of the subsoil ranges from dusky red and yellowish red to strong brown and olive yellow, with common mottles of gray. The subsoil is 9 to 36 inches thick and consists of clay that is very firm when moist and very plastic when wet.

Infiltration is poor. Most of the water from rainfall runs off the surface.

This soil is too eroded for cultivation, and most of the acreage is in forest. The areas that have been cleared should be kept in pasture or permanent hay crops. (Capability unit VIe–2, woodland suitability group 11, wildlife suitability group 1)

Wilkes Series

The Wilkes series consists of gently sloping to steep, very shallow to moderately deep soils that are well drained. These soils occupy small areas on side slopes and on rounded divides in the Piedmont uplands, where the difference in elevation is about 75 feet between the highest and the lowest points. They have formed under forest, mostly in the northern and western parts of the county, in material that weathered from mixed acidic and basic rocks. The water table remains below the solum.

Natural fertility is medium, and the content of organic matter is low. The available water capacity is low, and permeability and the shrink-swell potential are moderate. Except in areas that have received lime, these soils are slightly acid to medium acid. Response is fairly good if suitable applications of lime and fertilizer are made.

In Wake County the Wilkes soils are of only minor importance for farming. Most of the acreage is in forest.

Representative profile of a Wilkes sandy loam in a wooded area 3.5 miles north of N.C. Highway No. 54, on county road No. 1650, and 10 feet east of road:

Ap—0 to 8 inches, dark grayish-brown (2.5Y 4/2) sandy loam; moderate, medium, granular structure; very friable when moist; many fine and medium, woody and fibrous roots; many fine pores; common, medium and fine quartz pebbles; slightly acid; abrupt, wavy boundary.

B2t—8 to 12 inches, strong-brown (7.5YR 5/6) clay loam; common, fine, distinct, yellow mottles and few, fine, distinct, red mottles; strong, fine and medium, angular blocky structure to massive; firm when moist, sticky and plastic when wet; many fine and medium, woody and fibrous roots; few fine pores; thin, discontinuous clay films on vertical surfaces of peds; slightly acid; clear, wavy boundary.

B3—12 to 19 inches, pale-yellow (5Y 8/3), strong-brown (7.5YR 5/6), and yellowish-brown (10YR 5/6) clay loam mixed with particles of decomposed, fine-grained schist; massive; friable when moist; few, fine, woody roots in cracks; slightly acid; gradual, wavy boundary.

C1—19 to 29 inches, pale-yellow (5Y 8/3), yellowish-red (5YR 5/6), yellowish-brown (10YR 5/6), and black (10YR 2/1) silt loam; decomposed schist; few, fine, woody roots in cracks; slightly acid; clear, wavy boundary.

C2—29 to 38 inches, pale-green silt loam that is decomposed schist streaked with black (10YR 2/1) and strong brown (7.5YR 5/8); slightly acid.

R—38 inches +, hard, fine-grained schist containing a large amount of basic minerals.

The Ap horizon ranges from 3 to 12 inches in thickness, from yellowish brown or dark grayish brown to dark brown in color, and from sandy loam to silt loam in texture. The B2t horizon ranges from 2 to 10 inches in thickness, generally has a clay or clay loam texture, and has varied colors that range from 5YR to 10YR in hue. The B horizons range from 8 to 36 inches in combined thickness and from sandy loam to clay loam, mixed with saprolite, in texture. The color of the B horizons ranges from 5YR to 5Y in hue. These soils are generally massive. In many places they have clay films in the cracks. The solum ranges from 12 inches to 40 inches in thickness. Depth to hard rock ranges from 2 feet to 10 feet or more.

Wilkes soils occur with Louisburg, Wake, and Enon soils. They have a darker, more brownish color than the Louisburg and Wake soils and are less acid than those soils. Wilkes soils have a thinner solum than the Enon soils.

Wilkes soils, 2 to 10 percent slopes (WwC).—These soils are on small ridges and side slopes in the uplands. They have a yellowish-brown or grayish-brown to dark-brown surface layer of sandy loam to silt loam that is 3 to 12 inches thick and contains clayey spots in many places. The color of the subsoil ranges from brown or dark brown to gray and yellowish red. The subsoil is 8 to 36 inches thick. It ranges from sandy loam to clay loam in texture and from very friable to firm in consistence.

Infiltration is good, and surface runoff is medium to rapid. The hazard of erosion is very severe. These soils are somewhat difficult to till, but they can be worked throughout a fairly wide range of moisture content.

About two-thirds of the acreage is in forest, and the rest is in pasture or is cultivated. These soils are fairly well suited to many of the locally grown crops. Intensive practices that effectively control runoff and erosion are needed, however, if cultivated crops are grown. (Capability unit IVe–3, woodland suitability group 12, wildlife suitability group 4)

Wilkes soils, 10 to 20 percent slopes (WwE).—These soils are on side slopes that border upland drainageways. Their surface layer is yellowish-brown or grayish-brown to dark-brown sandy loam to silt loam and is 3 to 10 inches thick. In many places the surface layer contains clayey spots. The subsoil ranges from brown or dark brown to gray or yellowish red in color, from very friable to firm in consistence, and from sandy loam to clay loam in texture.

Infiltration is good. Surface runoff is very rapid.

These soils are mainly in forest, but a small acreage is in pasture. Because of the strong slopes and the bedrock near the surface in some places, the areas that have been cleared should be used only for pasture or for permanent hay crops. (Capability unit VIe–2, woodland suitability group 12, wildlife suitability group 4)

335-403—70——5

Wilkes soils, 20 to 45 percent slopes (WwF).—These soils are on side slopes bordering major drainageways in the uplands. They have a surface layer of yellowish-brown or grayish-brown to dark-brown sandy loam to silt loam 3 to 8 inches thick. Their subsoil ranges from brown or dark brown to gray or yellowish red in color, from very friable to firm in consistence, and from sandy loam to clay loam in texture.

Infiltration is good. Surface runoff is very rapid.

Practically all of the acreage is in forest. Because of the strong slopes and bedrock near the surface, these soils should be kept in forest. (Capability unit VIIe–1, woodland suitability group 12, wildlife suitability group 4)

Wilkes stony soils, 15 to 25 percent slopes (WxE).—The soils of this unit are on side slopes that border major drainageways in the uplands. Their surface layer is yellowish-brown or grayish-brown to dark-brown stony sandy loam 6 to 10 inches thick. Large stones occupy from 1 to 2 percent of the surface. The subsoil ranges from brown or dark brown to gray or yellowish red in color, from very friable to firm in consistence, and from sandy loam to clay loam in texture.

Infiltration is good. Surface runoff is very rapid.

Practically all of the acreage is in forest. Because of the strong slopes and bedrock near the surface, these soils should remain in forest. (Capability unit VIIe–1, woodland suitability group 12, wildlife suitability group 4)

Worsham Series

The Worsham series consists of nearly level and gently sloping, deep, poorly drained soils of Piedmont uplands. These soils occupy small areas throughout the county, at the heads of drainageways, on foot slopes, and in slight depressions. They have formed under forest in translocated material and in material that weathered from most kinds of rocks underlying this area. A seasonally high water table is approximately at the surface.

Natural fertility and the content of organic matter are low, and permeability is moderately slow. The available water capacity is medium, and the shrink-swell potential is moderate. Except in areas that have received lime, these soils are strongly acid. Response is fairly good if suitable applications of lime and fertilizer are made.

The Worsham soils of Wake County are of only minor importance for farming. Some areas have been cleared and are used for pasture or waterways, but most of the acreage is in forest. The areas that have been cleared and have then been allowed to revert to forest are in pines or in mixed pines and hardwoods.

Representative profile of Worsham sandy loam in a wooded area 2 miles southwest of Wendell on county road No. 2358, one-fourth of a mile north on county road No. 1003, and 25 yards east of road:

O1—5 to 2 inches, undecomposed forest litter.

O2—2 inches to 0, dark-brown, decomposed forest litter; part of litter is disintegrated, and part is not disintegrated; many fine and medium, woody roots.

A11—0 to 2 inches, gray (10YR 5/1) sandy loam; weak, medium and coarse, granular structure; very friable when moist; many fine and medium, woody roots; common fine pores; very strongly acid; abrupt, smooth boundary.

A12—2 to 7 inches, gray (10YR 5/1) sandy loam; weak, medium, granular structure; very friable when moist; common, fine and medium, woody roots; many fine pores; very strongly acid; abrupt, wavy boundary.

A2—7 to 11 inches, gray (10YR 6/1) sandy loam; weak, medium, granular structure; very friable when moist; common, fine, woody roots; common fine pores; strongly acid; abrupt, smooth boundary.

B1g—11 to 13 inches, light brownish-gray (10YR 6/2) sandy clay loam; common, medium, prominent, yellowish-brown mottles; weak, medium and coarse, subangular blocky structure; firm when moist, slightly sticky and slightly plastic when wet; common, fine, woody roots; common fine pores; strongly acid; abrupt, wavy boundary.

B21tg—13 to 18 inches, gray (10YR 6/1) heavy sandy clay loam; common, medium, prominent, strong-brown mottles; weak, medium and coarse, subangular blocky structure; firm when moist, sticky and plastic when wet; few, fine, woody roots; fine pores; thin clay films on ped surfaces; strongly acid; abrupt, wavy boundary.

B22tg—18 to 26 inches, gray (10YR 6/1) heavy sandy clay loam; few, medium, prominent, strong-brown and few, fine, prominent, yellowish-red mottles; weak, medium and coarse, subangular blocky structure; firm when moist, sticky and plastic when wet; few fine pores; few thin clay films on ped surfaces; strongly acid; abrupt, smooth boundary.

B23tg—26 to 38 inches, gray (10YR 6/1) light sandy clay; few, medium, prominent, strong-brown and few, fine, prominent, yellowish-red mottles; weak, medium, subangular blocky structure; firm when moist, slightly sticky and slightly plastic when wet; few fine pores; few thin clay films on ped surfaces; few small pebbles; strongly acid; abrupt, smooth boundary.

B3g—38 to 45 inches +, light-gray (10YR 7/1) sandy loam; few, medium, prominent, brownish-yellow mottles; massive; friable when moist, slightly sticky and slightly plastic when wet; common fine pores; many fragments of feldspar; strongly acid.

The A horizons range from 8 to 20 inches in total thickness and from gray or very dark gray to grayish brown or brown in color. The B horizons range from 20 to 50 inches in combined thickness and from sandy clay loam or sandy loam to sandy clay in texture. The Bt horizons have a gray color in 10YR and 2.5Y hues. In many places the Bt horizons are mottled with yellowish red to pale yellow. The solum ranges from 24 inches to 45 inches in thickness. Depth to hard rock ranges from 5 to 15 or more feet.

Worsham soils occur with Colfax and Bibb soils. They are more poorly drained than the Colfax soils and have a finer textured subsoil than the Bibb soils.

Worsham sandy loam (0 to 4 percent slopes) (Wy).—This is the only soil of the Worsham series mapped in Wake County. It occurs at the heads of drainageways, on foot slopes, and in slight depressions in the uplands. The surface layer is very dark brown or brown sandy loam 8 to 20 inches thick. The subsoil is 24 to 40 inches thick and consists of gray, firm silty clay loam or sandy clay, with common mottles of strong brown to pale yellow.

Infiltration is good, and surface runoff is slow to ponded. Permeability is moderately slow. Where this soil has been drained, it is easy to keep in good tilth, but tillage may be restricted after hard rains.

If this soil is cleared and properly drained, it is suited to corn, soybeans, and pasture. Most of the acreage is in forest, but some of it is cultivated or in pasture. (Capability unit IVw–1, woodland suitability group 2, wildlife suitability group 3)

Use and Management of the Soils

This section discusses use and management of the soils for crops and pasture, as woodland, for wildlife, and for engineering. It does not give detailed information about management of individual soils. For specific suggestions, consult a representative of the local office of the Soil Conservation Service, the Extension Service, or the Agricultural Experiment Station.

Use of the Soils for Crops and Pasture [3]

This section has three main parts. The first discusses the system of capability classification. The second describes the subclass and capability units in Wake County and gives general management suggestions for each capability unit. The third gives estimated yields at a high level of management for specific crops on each soil.

Capability groups of soils

Capability classification is the grouping of soils to show, in a general way, their suitability for most kinds of farming. It is a practical classification based on limitations of the soils, the risk of damage when they are used, and the way they respond to treatment. The classification does not apply to most horticultural crops, or to rice and other crops that have their special requirements. The soils are classified according to degree and kind of permanent limitation, but without consideration of major and general expensive landforming that would change the slope, depth, or other characteristics of the soils; and without consideration of possible but unlikely major reclamation projects.

In the capability system, all kinds of soils are grouped at three levels, the capability class, subclass, and unit. These are discussed in the following paragraphs.

Capability Classes, the broadest grouping, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I. Soils have few limitations that restrict their use.

Class II. Soils have some limitations that reduce the choice of plants or require moderate conservation practices.

Class III. Soils have severe limitations that reduce the choice of plants, require special conservation practices, or both.

Class IV. Soils have very severe limitations that restrict the choice of plants, require very careful management, or both.

Class V. Soils subject to little or no erosion but have other limitations, impractical to remove, that limit their use largely to pasture, range, woodland, or wildlife food and cover. (None in Wake County)

Class VI. Soils have severe limitations that make them generally unsuited to cultivation and limit their use largely to pasture or range, woodland or wildlife food and cover.

Class VII. Soils have very severe limitations that make them unsuited to cultivation and that restrict their use largely to grazing, woodland, or wildlife.

Class VIII. Soils and landforms have limitations that preclude their use for commercial plant production and restrict their use to recreation, wildlife, or water supply, or to esthetic purposes. (None in Wake County)

Capability Subclasses are soil groups within one class; they are designated by adding a small letter, *e*, *w*, *s*, or *c*, to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion; *w* shows that water in or on the soil surface interferes with plant growth or cultivation (in some soils wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in some parts of the United States but not in Wake County, shows that the chief limitation is climate that is too cold or too dry.

In class I there are no subclasses, because the soils of this class have few limitations. Class V (none in Wake County) can contain, at most, only subclasses indicated by *w*, *s*, and *c* because the soils in it are subject to little or no erosion, though they have other limitations that restrict their use largely to pasture, range, woodland, wildlife, or recreation.

Capability Units are soil groups within the subclasses. The soils in one capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity and other responses to management. Thus, the capability unit is a convenient grouping for making many statements about management of soils. Capability units are generally designated by adding an Arabic numeral to the subclass symbol, for example, IIe–1 or IIIw–1. Thus in one symbol, the Roman numeral designates the capability class or degree of limitation, and the small letter indicates the subclass, or kind of limitation, as defined in the foregoing paragraph. The Arabic numeral specifically identifies the capability unit within each subclass.

In the following pages, the capability units in Wake County are described and suggestions for the use and management of the soils are given. The names of the soil series represented are mentioned in the description of each capability unit, but this does not mean that all the soils of a given series appear in the unit. To find the names of all of the soils in any given capability unit, refer to the "Guide to Mapping Units" at the back of this survey.

CAPABILITY UNIT I–1

Only one soil, Norfolk loamy sand, 0 to 2 percent slopes, is in this capability unit. This soil is on Coastal Plain uplands and is nearly level and well drained. It has a surface layer of very friable loamy sand, 8 to 20 inches thick, and a subsoil of friable sandy loam to sandy clay loam.

Natural fertility and the content of organic matter are low. Permeability is moderate, and the available water capacity is medium. Reaction is strongly acid. This soil is easy to keep in good tilth, can be worked through-

[3] J. E. Pollock, conservation agronomist, Soil Conservation Service, and T. J. Wiggins, work unit conservationist, Soil Conservation Service, assisted in preparing this section.

out a wide range of moisture content, and has a very deep effective root zone. Response is good if suitable amounts of lime and fertilizer are applied.

A small acreage is in forest, but this soil is well suited to all the crops grown locally and is used mainly for tobacco, cotton, and other row crops. Clean-tilled crops can be grown intensively without serious risk of erosion.

Returning all crop residue to the soil helps to maintain the content of organic matter. Perennial grasses included in the cropping system help to reduce losses of soil and water and to make this soil more productive.

CAPABILITY UNIT IIe–1

This capability unit consists of well-drained, gently sloping soils on the Piedmont and Coastal Plain uplands. These soils are in the Appling, Cecil, Durham, Faceville, Granville, Madison, Mayodan, Norfolk, Orangeburg, and Wedowee series. They have a surface layer of loamy sand to fine sandy loam that in places contains gravel. The subsoil ranges from friable sandy loam to firm clay. In some places the plow layer is a mixture of the remaining original surface soil and of material from the subsoil; in other places the subsoil has been exposed through erosion.

Natural fertility and the content of organic matter are low. Permeability is moderate, and the available water capacity is medium. Reaction ranges from medium acid to strongly acid. The effective root zone is shallow to very deep. Response is good if suitable amounts of lime and fertilizer are applied. The uneroded soils are in good tilth and can be worked throughout a wide range of moisture content. The eroded soils are in fair tilth and can be worked within only a somewhat narrow range of moisture content. If the eroded soils are worked when too wet or too dry, they become cloddy and a crust forms on the surface. Stands of crops grown on the eroded soils are less uniform than those grown on the uneroded soils, even though the amount of rain is normal. Further erosion is a moderate hazard in cultivated areas.

About two-thirds of the acreage is cultivated or in pasture, and the rest is in forest or community developments. The soils are well suited to most of the crops grown in the county. They are especially well suited to tobacco but are not well suited to alfalfa, white clover, and red clover.

Runoff and erosion can be reduced by returning all crop residue to the soils; by protecting the soils with a close-growing crop 25 to 50 percent of the time; and by tilling along the contour, practicing stripcropping, and providing terraces and diversions. Field borders, natural draws, and other outlets needed for the disposal of runoff should be seeded to perennial grasses, preferably of a sod-forming type. Examples of suitable cropping systems are 2 or more years of close-growing crops followed by 1 or 2 years of a row crop; or 1 year of a close-growing crop followed by 1 year of a row crop. Perennial grasses are the most suitable close-growing crop.

CAPABILITY UNIT IIe–2

This capability unit consists of well-drained, gently sloping Georgeville, Herndon, Lloyd, and Mayodan soils on Piedmont uplands. These soils have a surface layer of loam or silt loam that in places contains gravel. The subsoil ranges from friable silty clay loam to firm clay. In some places the plow layer is a mixture of the remaining original surface soil and of material from the subsoil; in others the subsoil has been exposed through erosion.

Natural fertility and the content of organic matter are low. Permeability is moderate, and the available water capacity is medium. Reaction ranges from slightly acid to strongly acid. The effective root zone is shallow to deep. Response is good if suitable amounts of lime and fertilizer are applied. The uneroded soils are in good tilth and can be worked throughout a fairly wide range of moisture content. The eroded soils are in fair tilth and can be worked within only a somewhat narrow range of moisture content. Stands of crops grown on the eroded soils are not uniform, even though the amount of rain is normal. The hazard of further erosion is moderate in cultivated areas.

About two-thirds of the acreage is cultivated or in pasture; the rest is in forest or community developments. The soils are well suited to most of the crops grown locally, but they are less well suited to tobacco than the soils in capability units I–1 and IIe–1.

Runoff and erosion can be reduced, soil tilth improved, and productivity increased by returning all crop residue to the soils; by protecting the surface of the soils with a close-growing crop 25 to 50 percent of the time; and by tilling on the contour, practicing stripcropping, and providing terraces and diversions. Field borders, natural draws, and other outlets needed for disposing of runoff should be seeded to perennial grasses, preferably of a sod-forming type. Examples of suitable cropping systems are 1 or more years of a close-growing crop followed by 1 or 2 years of a row crop; or 1 year of a close-growing crop followed by 1 year of a row crop. Perennial grasses are the most suitable close-growing crop. Good soil structure can be maintained through minimum tillage.

CAPABILITY UNIT IIe–3

This capability unit consists of well drained or moderately well drained, gently sloping soils of the Creedmoor, Enon, Helena, Vance, and White Store series. These soils are on the Piedmont uplands. They have a surface layer of sandy loam to silt loam and a subsoil of firm or very firm silty clay loam to clay. In some places the plow layer is a mixture of the remaining original surface soil and of material from the subsoil. In others, the subsoil is exposed.

Natural fertility is low to medium, and the content of organic matter is low. Permeability is slow, and the available water capacity is medium to high. Reaction ranges from slightly acid to very strongly acid. The effective root zone is shallow to deep. Response is good if suitable applications of lime and fertilizer are made. The uneroded soils are in good tilth, but tillage after heavy rains is restricted because of the slowly permeable subsoil. The eroded soils are in fair tilth, but if tilled when too wet or too dry, they become cloddy and a crust forms on the surface. Stands of crops are not uniform on the eroded soils, even though the amount of rain is normal. Runoff is medium, and the hazard of further erosion is moderate in cultivated areas.

About two-thirds of the acreage is cultivated or in pasture; the rest is in forest. The soils of this unit are

fairly well suited to most of the crops grown locally, but the Enon soils are not well suited to tobacco.

Runoff and erosion can be reduced, soil tilth improved, and productivity increased by returning all crop residue to the soils; by protecting the surface of the soils with a close-growing crop from 25 to 50 percent of the time; and by tilling on the contour, practicing stripcropping, and providing diversions or terraces. Field borders, natural draws, and other outlets needed for disposing of runoff should be seeded to perennial grasses, preferably of a sod-forming type. Examples of suitable cropping systems are 2 or more years of close-growing crops followed by 1 or 2 years of a row crop; or 1 year of a close-growing crop followed by 1 year of a row crop. Perennial grasses are the most suitable close-growing crop. Good soil structure can be maintained through minimum tillage.

CAPABILITY UNIT IIw–1

This capability unit consists of moderately well drained and somewhat poorly drained, nearly level or gently sloping soils on stream terraces and uplands of the Coastal Plain. These soils are in the Altavista, Goldsboro, and Lynchburg series. They have a surface layer of sandy loam or fine sandy loam and a subsoil of friable sandy loam to firm clay loam.

Natural fertility and the content of organic matter are low, the available water capacity is medium, and permeability is moderate. These soils are in good tilth and have a very deep or deep effective root zone. Reaction ranges from medium acid to strongly acid. Response is good if suitable applications of lime and fertilizer are made. The Altavista soil is flooded infrequently, but flooding does not last long.

Most of the acreage is cultivated or in pasture, and only a small acreage is in forest. These soils are well suited to most of the crops grown locally, but they are not well suited to alfalfa, red clover, and orchardgrass.

There are no serious hazards if these soils are used intensively for clean-tilled crops, but a moderately high water table affects management and is a soil limitation to some uses. Some drainage is generally needed if tobacco and other specialized crops are grown. Row crops can be grown year after year if all crop residue is returned to the soils. The content of organic matter and favorable soil tilth can be maintained if close-growing crops, preferably perennial grasses, are grown every other year or 1 year out of 3.

CAPABILITY UNIT IIw–2

This capability unit consists of well drained and moderately well drained, nearly level Congaree soils on the flood plains of streams. These soils have a surface layer of fine sandy loam to silt loam, underlain by friable or very friable fine sandy loam to silt loam or silty clay loam.

Natural fertility and the content of organic matter are low, the available water capacity is medium, and permeability is moderate to moderately rapid. These soils are in good tilth and have a deep effective root zone. They are strongly acid. Response is good if suitable applications of lime and fertilizer are made.

Most of the acreage is cultivated or in pasture, but a small acreage is in forest. These soils are well suited to most of the crops grown locally. Corn, small grains, bermudagrass, fescue, and johnsongrass grow well on them.

Flooding is the only serious hazard if these soils are cultivated intensively. In some areas, however, simple drainage is needed to improve small wet spots. If all crop residue is returned to the soils, row crops can be grown year after year. The soils can be kept productive and the content of organic matter and good soil tilth can be maintained if close-growing crops, preferably perennial grasses, are grown every other year or 1 year out of 3.

CAPABILITY UNIT IIs–1

This capability unit consists of somewhat excessively drained, nearly level and gently sloping Wagram soils on Coastal Plain uplands. These soils have a surface layer of loamy sand, 20 to 30 inches thick, and a subsoil of very friable sandy loam to friable sandy clay loam.

Natural fertility and the content of organic matter are low or very low. The available water capacity is low, and permeability is moderate. These soils are in good tilth, can be tilled throughout a wide range of moisture content, and have a very deep effective root zone. They are droughty and highly susceptible to leaching, however, and are medium acid to strongly acid. Response is good if suitable applications of lime and fertilizer are made.

Most of the acreage is cultivated or in pasture, but a small acreage is in forest. These soils are fairly well suited to most of the crops grown locally, but crop residue and other kinds of organic matter burn out rapidly. A cropping system that adds a large amount of long-lasting crop residue is needed. Examples of such a cropping system are 2 or more years of perennial grasses or legumes followed by a row crop grown for 1 or 2 years; or 1 or more years of a dense stand of annuals followed by a row crop grown for 1 year. Tillage should be done on the contour and kept to a minimum, terraces or diversions are needed, and stripcropping is desirable on the sloping soils (fig. 11). Natural draws and other outlets for disposal of excess surface water ought to be seeded to perennial grasses, preferably of a sod-forming type. Fertilizer, especially nitrogen, should be added in split application.

CAPABILITY UNIT IIIe–1

Well-drained, sloping soils of the Piedmont and Coastal Plain uplands make up this capability unit. These soils are in the Appling, Cecil, Durham, Faceville, Granville, Madison, Mayodan, Norfolk, Orangeburg, and Wedowee series. They have a surface layer of loamy sand to fine sandy loam and a subsoil of friable sandy loam to firm clay. In places the plow layer is a mixture of the remaining original surface soil and of material from the subsoil. In some spots the subsoil has been exposed through erosion. In places these soils contain gravel that interferes with tillage.

Natural fertility and the content of organic matter are low. Permeability is moderate, and the available water capacity is medium. Reaction is medium acid to strongly acid. The effective root zone is shallow to very deep. Response is good if suitable applications of lime and fertilizer are made. The uneroded soils are in good tilth and can be worked throughout a wide range of moisture content. Tilth is only fair in the eroded soils, and those

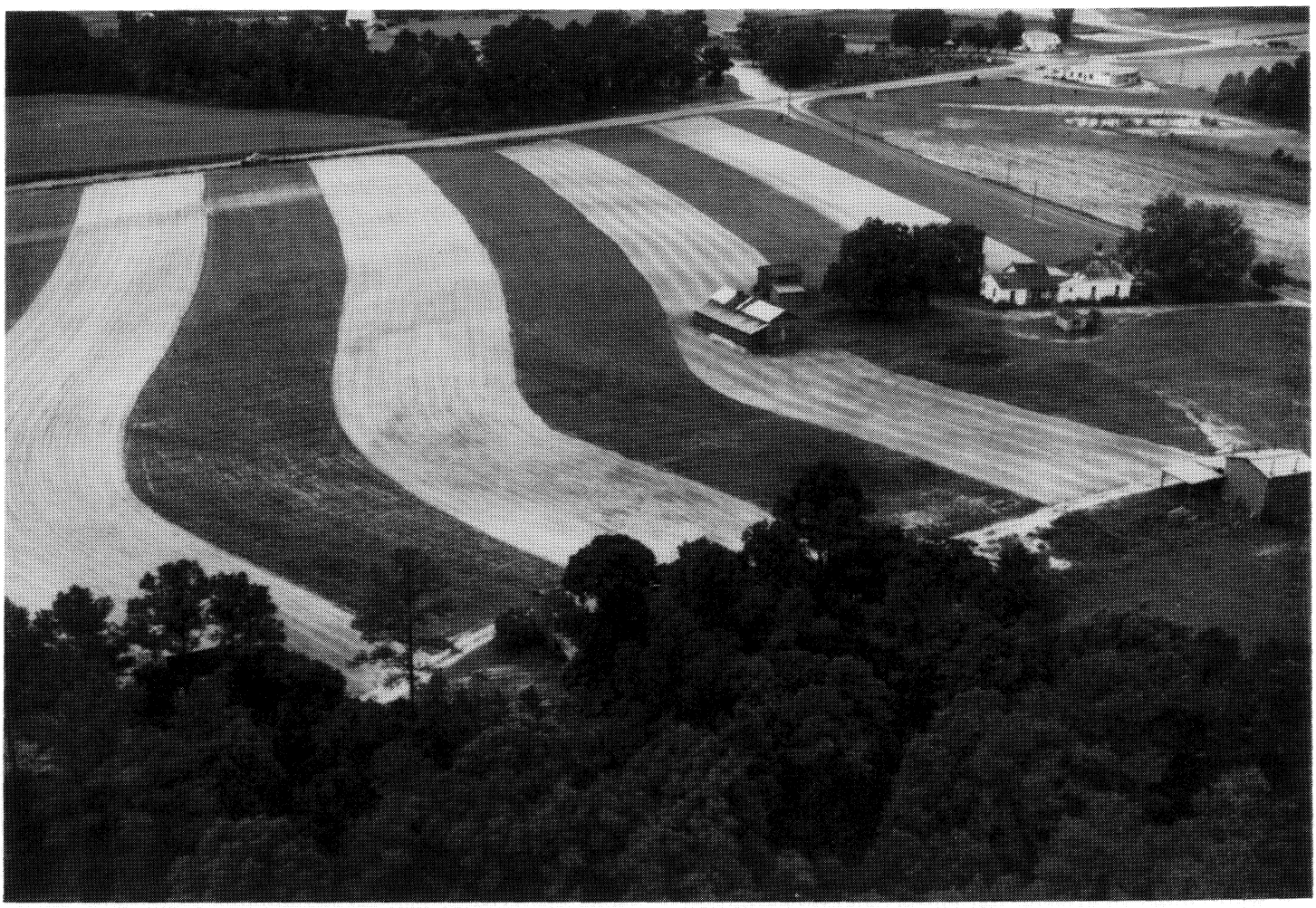

Figure 11.—**Contour stripcropping of corn and fescue. The soil on the far side of the field is Wagram loamy sand, 2 to 6 percent slopes; that in the foreground is Wagram loamy sand, 6 to 10 percent slopes.**

soils can be tilled within only a fairly narrow range of moisture content. A crust forms on the eroded soils, and those soils become cloddy if worked when too wet or too dry. Stands of crops on the eroded soils are not uniform, even though the amount of rain is normal. Erosion is a severe hazard in the cultivated areas.

About one-third of the acreage is cultivated or in pasture; the rest is in forest or in community developments. These soils are well suited to most of the crops grown locally.

Erosion and losses of water can be reduced, soil tilth can be improved, and productivity and the content of organic matter can be increased by returning all crop residue to the soils, by protecting the soils with a close-growing crop 50 to 75 percent of the time, and by tilling on the contour, practicing stripcropping, and installing terraces or diversions where needed. Natural draws or waterways, the borders of fields, and other outlets needed for disposing of runoff should be seeded to perennial grasses, preferably of a sod-forming type. A suitable cropping system is 2 or more years of crops that protect the soils from erosion followed by 1 year of a row crop; or 2 years of crops that protect the soils from erosion followed by 2 years of row crops. Perennial grasses are the most suitable crop to protect the soils from erosion.

CAPABILITY UNIT IIIe-2

In this capability unit are well-drained, gently sloping and sloping soils of the Cecil, Georgeville, Herndon, Lloyd, and Mayodan series. These soils are on Piedmont uplands. They have a surface layer of loam or silt loam to clay loam and a subsoil of friable silty clay loam to firm clay. The amount of gravel in some places is great enough to interfere with tillage. The plow layer is a mixture of the remaining original surface soil and of material from the subsoil; in some spots the subsoil has been exposed through erosion. The Cecil soil is severely eroded. Its surface layer is mainly material from the subsoil, but it contains some material from the original surface layer.

Natural fertility and the content of organic matter are low. The available water capacity is medium, and permeability is moderate. The uneroded soils are in good tilth and can be worked throughout a fairly wide range of moisture content. Tilth is fair to poor in the eroded soils. A crust forms on the surface and the eroded soils

become cloddy if they are worked when too wet or too dry. Stands of crops on the eroded soils are not uniform, even though the amount of rain is normal. Erosion is a severe hazard in the cultivated areas. The effective root zone ranges from deep to shallow, and reaction ranges from slightly acid to strongly acid. Response is good if suitable applications of lime and fertilizer are made.

About one-third of the acreage is cultivated or in pasture, and the rest is in forest or community development. These soils are fairly well suited to most of the crops grown locally and are well suited to grasses, legumes, and small grains.

Erosion and losses of water can be reduced, tilth can be improved, and productivity and the content of organic matter can be increased by returning all crop residue to soils; by protecting the soils with a close-growing crop 50 to 75 percent of the time; and by tilling on the contour, practicing stripcropping, and installing terraces or diversions where needed. The borders of fields, natural draws, and other outlets needed for disposing of runoff should be seeded to perennial grasses, preferably of a sod-forming type. A suitable cropping system is 2 or more years of a crop that protects the soils from erosion followed by 1 year of a row crop; or 3 or more years of crops that protect the soil from erosion followed by 1 or 2 years of a row crop. Perennial grasses are the most suitable crop to protect the soils from erosion.

CAPABILITY UNIT IIIe–3

This capability unit consists of well drained and moderately well drained, gently sloping and sloping soils of the Creedmoor, Enon, Helena, Vance, and White Store series. These soils are on Piedmont uplands. They have a surface layer of sandy loam to silt loam and a subsoil of firm or very firm silty clay loam to clay. In places the plow layer is a mixture of the remaining original surface soil and of material from the subsoil; in spots the subsoil has been exposed through erosion.

Natural fertility is low to medium, and the content of organic matter is low. Permeability is slow, and the available water capacity is medium to high. Reaction ranges from slightly acid to very strongly acid. The effective root zone is shallow to deep. Erosion is a severe hazard in cultivated areas. The uneroded soils are in good tilth, but tillage is restricted after heavy rains because of the slowly permeable subsoil. Tilth is fair in the eroded soils, but a crust forms on the surface and the eroded soils become cloddy if they are worked when too wet or too dry. Stands of crops are not uniform on the eroded soils, even though the amount of rain is normal.

About one-third of the acreage is cultivated or in pasture, and the rest is in forest. The uneroded soils are well suited to the crops grown locally; the eroded soils are only fairly well suited.

Erosion and losses of water can be reduced, soil tilth can be improved, and productivity and the content of organic matter can be increased by returning all crop residue to the soils; by protecting the soils with a close-growing crop 50 to 75 percent of the time; and by practicing contour tillage, stripcropping, and installing terraces or diversions where needed. Borders of fields, natural draws, and other outlets needed for disposing of runoff should be seeded to perennial grasses, preferably of a sod-forming type. A suitable cropping system for these soils is 2 or more years of a crop that protects the soils followed by 1 or 2 years of a row crop. Perennial grasses are the most suitable crop to protect the soils from erosion.

CAPABILITY UNIT IIIe–4

Well drained to somewhat excessively drained, gently sloping Louisburg and Wedowee soils are in this capability unit. These soils are on Piedmont uplands. They have a surface layer of loamy sand or sandy loam and a highly variable subsoil. In places the plow layer is a mixture of the remaining original surface soil and of material from the subsoil; in some spots the subsoil is exposed.

Natural fertility and the content of organic matter are low. Permeability is moderate to rapid, and the available water capacity is low to medium. Reaction is strongly acid. The effective root zone is shallow to moderately deep. Response is good if suitable applications of lime and fertilizer are made. The soils in this unit are generally in good tilth, but stones are near the surface in some areas. Some of the soils are eroded, and further erosion is a severe hazard.

About three-fourths of the acreage is in forest; the rest is in pasture or cultivated crops. These soils are poorly suited to most of the crops grown locally. If management is good, however, tobacco of good quality can be grown on the uneroded, gently sloping soils. The soils are suitable for pasture, hay, or trees, and they can be used for recreation or as habitat for wildlife.

Erosion and losses of water can be reduced, the content of organic matter can be increased, and productivity and soil tilth improved by returning all crop residue to the soils; by protecting the soils with a close-growing crop about 75 percent of the time; and by practicing contour tillage and stripcropping and installing diversions. A suitable cropping system is 3 or more years of crops that protect the soils from erosion followed by 1 year of a row crop; or 2 years of crops that protect the soil from erosion followed by 1 year of a row crop. Perennial grasses are the most suitable crop for protecting the soils from erosion. The borders of fields, natural draws, and other outlets needed for the disposal of runoff should be seeded to perennial grasses, preferably of a sod-forming type.

CAPABILITY UNIT IIIe–5

Only Wagram loamy sand, 6 to 10 percent slopes, is in this capability unit. It is a somewhat excessively drained soil on Coastal Plain uplands. The surface layer is very friable loamy sand, 20 to 30 inches thick, and the subsoil is very friable sandy loam to friable sandy clay loam.

Natural fertility and the content of organic matter are low or very low. The available water capacity is low, and permeability is moderate. This soil is in good tilth and can be worked throughout a wide range of moisture content. It is droughty, however, and the hazard of erosion is severe if cultivated crops are grown. The effective root zone is very deep. Reaction is medium acid to very strongly acid. Plant nutrients leach out rapidly, but response is good if suitable applications of lime and fertilizer are made.

This soil is fairly well suited to bermudagrass and to most of the other crops grown locally. It is poorly suited

to alfalfa, white clover, and red clover. Erosion and losses of water can be reduced, soil tilth improved, and productivity and the content of organic matter maintained by returning all crop residue to the soil; by growing soil-conserving crops 50 to 75 percent of the time; and by practicing contour tillage and stripcropping. A suitable cropping system is 2 or more years of close-growing crops, 1 year of a row crop followed by a cover crop, and then another year of a row crop; or 1 or more years of a close-growing crop followed by 1 year of a row crop. Perennial grasses are the most suitable close-growing crop. Natural draws, the borders of fields, and other outlets needed for disposing of runoff should be seeded to a perennial grass, preferably of a sod-forming type. Liberal amounts of fertilizer, in split applications, are needed.

CAPABILITY UNIT IIIw–1

This capability unit consists only of Chewacla soils. These soils are somewhat poorly drained and nearly level, and they occur on the flood plains of streams. They have a surface layer of sandy loam to silt loam, underlain by friable or very friable sandy loam to silt loam or clay loam.

Natural fertility and the content of organic matter are low. The available water capacity is medium, and permeability is moderate to moderately rapid. These soils are in good tilth and have a deep effective root zone. They are strongly acid, but response is good if suitable applications of lime and fertilizer are made. The soils are subject to overflow, and wetness is a severe hazard.

Most of the acreage is in forest, but a small acreage is cultivated or in pasture. These soils are fairly well suited to corn, oats, white clover, dallisgrass, fescue, and other crops that are at least fairly tolerant of excess water. They are better suited to pasture than to field crops. Artificial drainage is needed for most crops. The content of organic matter can be maintained and tilth can be improved by returning large quantities of crop residue to the soils. A suitable cropping system is 1 or more years of a crop that provides a dense cover followed by 1 or 2 years of a row crop.

CAPABILITY UNIT IIIw–2

This capability unit consists of somewhat poorly drained, nearly level and gently sloping soils of the Augusta, Colfax, Mantachie, and Wahee series. These soils are in depressions and on foot slopes, stream terraces, and Piedmont and Coastal Plain uplands. They have a surface layer of sandy loam to silt loam, underlain by sandy loam to very firm clay.

Natural fertility is medium to low, and the content of organic matter is low. The available water capacity is medium, and permeability is moderately rapid to slow. These soils are in good to fair tilth and have a deep or moderately deep effective root zone. They are medium acid to very strongly acid. Plant nutrients leach out rapidly, but response is good if suitable applications of lime and fertilizer are made. These soils are susceptible to flooding, and wetness is a severe hazard.

Most of the acreage is in forest, but a small acreage is cultivated or in pasture. These soils are of limited suitability for crops, but they can be used for corn, oats, rye, white clover, soybeans, annual lespedeza, fescue, and dallisgrass. They are better suited to pasture than to field crops. Drainage and good management are needed. The content of organic matter can be maintained and the structure of the soils can be improved by returning all crop residue to the soils. A suitable cropping system is 3 or more years of pasture followed by 2 years of clean-tilled crops; or 1 or more years of a crop that protects the soils, followed by 1 year of a clean-tilled crop.

CAPABILITY UNIT IIIw–3

Rains fine sandy loam is the only soil in this capability unit. It is poorly drained and nearly level, and it occurs in depressions on Coastal Plain uplands. The surface layer is very friable fine sandy loam, and the subsoil is friable sandy loam to firm clay loam.

Natural fertility is low, and the content of organic matter is medium. Permeability is moderate, and the available water capacity is medium. This soil is in good tilth and has a very deep effective root zone. Reaction is very strongly acid or strongly acid. Response is good if suitable applications of lime and fertilizer are made. Wetness is a severe hazard where field crops, pasture plants, or hay are grown

Most of the acreage is in forest, but a small acreage is cultivated or in pasture. This soil is limited in suitability for crops. Where it has been drained, however, it is fairly well suited to corn, fescue, dallisgrass, white clover, soybeans, annual lespedeza, and oats, though it requires good management.

Drainage is the major requirement if this soil is farmed. Where drainage is provided, row crops may be grown year after year, but all crop residue should be returned to the soil. Productivity, a desirable content of organic matter, and good tilth can be maintained if perennial grasses and legumes are included in the cropping system, and if they make up from 25 to 50 percent of the cropping sequence.

CAPABILITY UNIT IIIs–1

Only Wagram-Troup sands, 0 to 4 percent slopes, is in this capability unit. It consists of somewhat excessively drained soils on Coastal Plain uplands. The surface layer of these soils is loose sand, 30 to 60 inches thick, and the subsoil is very friable sandy loam to friable sandy clay loam.

Natural fertility, the content of organic matter, and the available water capacity are low or very low. Permeability is moderate to rapid. These soils are in good tilth and have a very deep effective root zone. They are medium acid to very strongly acid. Response is good if suitable applications of lime and fertilizer are made.

About two-third of the acreage is cultivated or in pasture; the rest is in forest. Even though these soils are managed properly, they are not well suited to most of the crops grown locally. They are more suitable for use as recreational areas or for the growing of peaches and watermelons than for growing field crops.

Runoff and erosion can be reduced, soil tilth improved, the content of organic matter maintained, and productivity increased by returning all crop residue to the soils. Crop residue and other organic matter burn out of the soils rapidly. The surface needs to be protected by a close-growing crop, preferably a perennial crop, at least

50 percent of the time. A suitable cropping system is one that adds a large amount of durable residue and that consists of crops grown in strips. Examples of suitable cropping systems are 3 or more years of perennial grasses or legumes followed by 1 or 2 years of a row crop; or 2 years of a crop that provides a dense cover followed by 1 year of a row crop. All major draws and field borders used for disposing of runoff ought to be seeded to a perennial grass. Fertilizer, especially nitrogen, should be added in split applications.

CAPABILITY UNIT IVe–1

This capability unit consists of well-drained, strongly sloping Appling, Cecil, Granville, Madison, Mayodan, and Wedowee soils on Piedmont uplands. These soils have a surface layer of sandy loam and a subsoil of friable sandy clay loam to firm clay. In some eroded areas, the plow layer is a mixture of the remaining original surface soil and of material from the subsoil. In others the subsoil has been exposed through erosion. Further erosion is a severe hazard in the cultivated areas.

Natural fertility and the content of organic matter are low. Permeability is moderate, and the available water capacity is medium. Reaction is medium acid to strongly acid. The effective root zone is shallow to deep. Response is good if suitable applications of lime and fertilizer are made. Tilth of the uneroded soils is good; that of the eroded soils is only fair. The eroded soils can be tilled within only a fairly narrow range of moisture content. A crust forms on the surface and the eroded soils become cloddy if worked when too wet or too dry. Stands of crops are not uniform on the eroded soils, even though the amount of rain is normal.

About two-thirds of the acreage is in forest or community developments; the rest is cultivated or in pasture. Given proper management, these soils are fairly well suited or well suited to most of the crops grown locally. Their use for crops is limited, however, by low natural fertility and susceptibility to leaching. Losses of soil and water can be reduced, soil tilth improved, and productivity and the content of organic matter increased by protecting the soils with a close-growing crop at least 75 percent of the time; by tilling along the contour; and by seeding field borders, providing diversions, practicing stripcropping, and returning all crop residue to the soils. Perennial grasses are the most suitable close-growing crop. Natural draws and other needed outlets for disposing of runoff should be seeded to perennial grasses, preferably of a sod-forming type. A suitable cropping system is 3 years or more of perennial grasses or legumes followed by 1 year of a row crop.

CAPABILITY UNIT IVe–2

This capability unit consists of a well-drained, sloping and strongly sloping Cecil, Georgeville, Herndon, Lloyd, and Mayodan soils on Piedmont uplands. These soils have a surface layer of loam or silt loam to clay loam and a subsoil of friable silty clay loam to firm clay. Most of the soils are eroded, and the Cecil soil is severely eroded. Further erosion is a severe hazard in cultivated areas. In some eroded areas, the plow layer is a mixture of the remaining original surface soil and of material from the subsoil; in others the subsoil is exposed. The surface layer of the Cecil soil is mainly material from the subsoil, but it contains a small amount of material from the original surface layer. In places the soils in this unit contain enough gravel to interfere with tillage.

Natural fertility and the content of organic matter are low. Permeability is moderate, and the available water capacity is medium. Reaction is slightly acid to strongly acid. The effective root zone is shallow to deep. Response is good if suitable applications of lime and fertilizer are made. The uneroded or only slightly eroded soils, such as the Mayodan, are in good tilth, but the eroded soils are in fair to poor tilth. A crust forms on the surface of the eroded soils, and those soils become cloddy if worked when too wet or too dry. Even though the amount of rain is normal, stands of crops are not uniform on the eroded soils.

About two-thirds of the acreage is in forest or in community developments; the rest is cultivated or in pasture. Given proper management, the soils of this unit are fairly well suited to most of the crops grown locally. They are better suited to pasture and hay, however, than to field crops.

Erosion and losses of water can be reduced, soil tilth improved, and productivity and the content of organic matter increased by returning all crop residue to the soils; by protecting the soils with a close-growing crop at least 75 percent of the time; and by tilling on the contour, practicing stripcropping, and establishing diversions. Natural draws, the borders of fields, and other outlets needed for disposing of runoff should be seeded to perennial grasses that produce sod. Suitable cropping systems are 3 or more years of perennial grasses or legumes followed by 1 year of a row crop; or 4 or more years of perennial grasses or legumes followed by 2 years of row crops.

CAPABILITY UNIT IVe–3

This capability unit consists of well-drained and somewhat excessively drained, nearly level to strongly sloping Creedmoor, Enon, Helena, Louisburg, Pinkston, Wake, Wedowee, White Store, and Wilkes soils on Piedmont uplands. These soils have a surface layer of loamy sand to silt loam and a subsoil of friable loamy sand to very firm clay. In some places the plow layer is a mixture of the remaining original surface soil and of material from the subsoil. In other places the subsoil is exposed. In places these soils contain gravel and stones in amounts that interfere with tillage. Some soils contain rock outcrops (fig. 12).

Natural fertility is low to medium, and the content of organic matter is low. Permeability is slow to moderately rapid, and the available water capacity is very low to high. Reaction is slightly acid to very strongly acid. The effective root zone is very shallow to deep. Response is good if suitable applications of lime and fertilizer are made. Some of the soils are eroded, and further erosion is a very severe hazard if those soils are cultivated. The uneroded soils are in good tilth, but tilth of the eroded soils is fair to poor. If the eroded soils are worked when too wet or too dry, a crust tends to form on the surface and these soils become cloddy. On the eroded soils, stands of crops are not uniform, even though the amount of rain is normal.

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Figure 12.—**Pasture of poor quality on Wake soils, 2 to 10 percent slopes, in capability unit IVe–3. Rock outcrops are common in some areas of these soils.**

About three-fourths of the acreage is in forest; the rest is cultivated or in pasture. The uneroded or only slightly eroded soils in this unit are fairly well suited to well suited to most of the crops grown locally. They are better suited to pasture and hay than to cultivated crops. The eroded soils are poorly suited or only fairly well suited to the locally grown crops.

Erosion and losses of water can be reduced, soil tilth improved, and productivity and the content of organic matter increased by returning all crop residue to the soils; by protecting the soils with perennial grasses at least 75 percent of the time; and by tilling on the contour, practicing stripcropping, and establishing diversions. Natural draws, the borders of fields, and other outlets needed for disposing of runoff should be seeded to perennial grasses that produce sod. Suitable cropping systems are 3 or more years of perennial grasses or legumes followed by 1 year of a row crop; or 4 or more years of perennial grasses or legumes followed by 2 years of row crops.

CAPABILITY UNIT IVw–1

This capability unit consists of poorly drained, nearly level or gently sloping soils of the Plummer, Roanoke, Wehadkee, Bibb, and Worsham series. These soils are in upland depressions, on the flood plains of streams, and on stream terraces. Their surface layer ranges from sand to silt loam, and their subsoil ranges from friable sandy loam to very firm clay.

Natural fertility is very low to medium, and the content of organic matter is low to moderate. Permeability is slow to rapid, and the available water capacity is low to medium. Wetness is a very severe hazard. Reaction is strongly acid to very strongly acid. Response is fairly good if suitable applications of lime and fertilizer are made. These soils are in good tilth, and they have a moderately deep or deep effective root zone.

Most of the acreage is in forest, but a small acreage is cultivated or in pasture. These soils have a narrow range of suitability for crops, and as a rule, they are poorly suited to row crops. Where these soils have been drained, they are fairly well suited to white clover, annual lespedeza, fescue, and dallisgrass. Pastures are fair to good in areas that have been drained.

A high water table, overflow, and a lack of outlets are limitations to the use of these soils for crops. A complete drainage system is needed for all areas intended for pasture and field crops. Proper amounts of lime and a large amount of a suitable fertilizer are also needed.

CAPABILITY UNIT IVs–1

This capability unit consists of somewhat excessively drained, nearly level Buncombe soils on first bottoms. The surface layer and the subsoil of the Buncombe soils are loose sand or loamy sand.

Natural fertility and the content of organic matter are very low. Permeability is rapid, and the available water capacity is low. Reaction is strongly acid. The effective root zone is deep. Response is fairly good if suitable applications of lime and fertilizer are made. These soils are in good tilth, but during long dry spells, crops may be damaged from lack of moisture. Plant nutrients leach out rapidly.

Most of the acreage is cultivated, and a small acreage is in forest. Even if these soils are properly managed, they are not suited or are only poorly suited to most of the crops grown locally. They are suitable for trees, for recreational areas, and as habitat for wildlife.

Organic matter that helps to retard the leaching of plant nutrients can be added by returning all crop residue to the soils and by keeping a close-growing crop on the soils at least half the time. Suitable crops are ones that produce a large amount of durable residue. A desirable cropping system is one in which perennial grasses or legumes are grown for 2 years and are followed by a row crop grown for 1 year. Liberal amounts of fertilizer, applied in split applications, are needed to keep these soils productive.

CAPABILITY UNIT VIe–1

This capability unit consists of well drained or moderately well drained, strongly sloping to steep soils on Piedmont uplands. These soils are in the Cecil, Creedmoor, Herndon, Louisburg, Madison, Mayodan, Wedowee, and White Store series. They have a surface layer of loose loamy sand to friable silt loam and a subsoil of friable sandy loam or sandy clay loam to very firm clay. In some places the plow layer is a mixture of the remaining original surface soil and of material from the subsoil, but in other places the subsoil is exposed.

Natural fertility and the content of organic matter are low. Permeability is slow to moderately rapid, and the available water capacity ranges from low to high. Reaction is medium to strongly acid. The effective root zone is shallow to deep. Response is good if suitable applications of fertilizer are made. The uneroded soil is in good tilth. Tilth of the eroded soil is fair to poor, and that

soil can be worked within only a narrow range of moisture content. A crust forms on the surface of the eroded soil, and clods form if that soil is worked when too wet or too dry. Stands of crops are not uniform on the eroded soil, even though the amount of rain is normal.

Most of the acreage is in forest, and small acreages are cultivated or in pasture. The soils are suitable for trees and for use as wildlife habitat. Because of slopes, erosion, runoff, lack of adequate surface soil, and low natural fertility, these soils are not suited to cultivation. The uneroded soils are fairly well suited to such legumes and perennial grasses as sericea lespedeza, kudzu, white clover, bermudagrass, and fescue. The eroded areas are suited to sericea lespedeza and kudzu. A fair amount of forage can be produced for grazing if the soils are well managed.

CAPABILITY UNIT VIe-2

This unit consists of well-drained or somewhat excessively drained, gently sloping to moderately steep soils on Piedmont uplands. These soils are in the Cecil, White Store, and Wilkes series. They have a surface layer of very friable sandy loam to firm clay loam and a subsoil of very friable sandy loam to very firm clay. Where the surface layer is clay loam, it consists mainly of material from the subsoil that has been mixed with a small amount of material from the original surface layer.

Natural fertility is low to medium, and the content of organic matter is low. Permeability is slow to moderate, and the available water capacity is low to high. Reaction is slightly acid to very strongly acid. The effective root zone is very shallow to deep. Response is good if suitable applications of lime and fertilizer are made. The uneroded soils are in good tilth. The eroded soils are in fair to poor tilth, and they can be worked within only a narrow range of moisture content. A crust forms on the eroded soils, and those soils become cloddy if worked when too wet or too dry. Stands of crops grown on the eroded soils are not uniform, even though the amount of rain is normal.

Most of the acreage is in forest, and small acreages are cultivated or in pasture. These soils are suitable for trees and for use as wildlife habitat. Because of their slopes, shallowness, and erosion, they are not suitable for cultivation. They are, however, fairly well suited to kudzu, sericea lespedeza, white clover, and fescue. Kudzu can be grown on the eroded areas. A fair amount of forage can be produced for grazing if the soils in this unit are properly managed.

CAPABILITY UNIT VIIe-1

This unit consists of well drained or somewhat excessively drained, strongly sloping to steep soils of the Pinkston, Wake, and Wilkes series and of areas of Gullied land. These soils are on Piedmont uplands. Their surface layer is sandy loam to clay loam or clay, and their subsoil is loose loamy sand to very firm or plastic clay. Soils of this unit range from slightly eroded to gullied. In the slightly eroded places, the plow layer is a mixture of the remaining original surface soil and of material from the subsoil. Where more erosion has occurred, the present surface layer is mainly material from the subsoil. In gullied areas nearly all the original surface soil is gone.

Figure 13.—**Gullied land that is not practical to reclaim for cultivation or pasture and that should be used for trees or other permanent vegetation.**

In places part or all of the subsoil has been lost through gullying (fig. 13).

The soils in this unit have low to medium natural fertility and are low in content of organic matter. Permeability is moderate to moderately rapid, and the available water capacity is low or very low. Reaction is slightly acid to strongly acid. The effective root zone is very shallow to moderately deep.

All of the acreage is in forest or is idle. The soils are too steep, eroded, and droughty to be suited to cultivation. They are suited to trees, to recreational uses, and to development for wildlife habitat. They are fairly well suited to kudzu and sericea lespedeza and produce a fair amount of forage for grazing if properly managed.

CAPABILITY UNIT VIIw-1

Only the miscellaneous land type, Swamp, is in this unit. It is very poorly drained and nearly level, and it occurs on stream flood plains at the upper end of man-made lakes. The soil material was washed from uplands and deposited during periods of heavy rains. It is highly variable in texture and very friable and loose.

Swamp is covered by water nearly all of the time, and it has a very shallow effective root zone. It is in forests of poor quality. Wetness and flooding make this land type unsuited to crops or pasture, and drainage is difficult or impractical. The areas can be used as woodland and as habitat for wildlife.

Estimated yields

Table 2 gives estimates of yields of the principal crops grown in Wake County. The yields depend upon a combination of soils and climate, the kind of crop, and the level of management. The estimates in table 2 are based on high-level management. Yields are substantially lower under less intensive management.

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TABLE 2.—*Estimated average yields per acre of important crops grown under a high level of management*

[Dashed lines indicate that the crop is not commonly grown on the soil or that data on which to base an estimate are not available]

Soils	Corn	Cotton (lint)	Oats	Tobacco (flue cured)	Soybeans	Hay		Fescue-white clover pasture
						Soybean	Annual lespedeza	
	Bu.	*Lb.*	*Bu.*	*Lb.*	*Bu.*	*Tons*	*Tons*	*Animal-unit days* [1]
Altavista fine sandy loam, 0 to 4 percent slopes	70	450	65	2,400	32	2.1	1.5	185
Appling gravelly sandy loam, 2 to 6 percent slopes	73	700	75	2,300	30	2.0	1.5	185
Appling gravelly sandy loam, 2 to 6 percent slopes, eroded	68	625	70	2,200	28	1.9	1.5	180
Appling gravelly sandy loam, 6 to 10 percent slopes	65	600	65	2,150	26	1.7	1.4	175
Appling gravelly sandy loam, 6 to 10 percent slopes, eroded	60	525	60	2,100	23	1.5	1.3	155
Appling sandy loam, 2 to 6 percent slopes	73	700	75	2,300	30	2.0	1.5	185
Appling sandy loam, 2 to 6 percent slopes, eroded	68	625	70	2,200	28	1.9	1.5	180
Appling sandy loam, 6 to 10 percent slopes	65	600	65	2,150	26	1.7	1.4	175
Appling sandy loam, 6 to 10 percent slopes, eroded	60	525	60	2,100	23	1.5	1.3	155
Appling sandy loam, 10 to 15 percent slopes	55	475	58	2,000	20	1.3	1.3	155
Appling fine sandy loam, 2 to 6 percent slopes	73	700	75	2,300	30	2.0	1.5	185
Appling fine sandy loam, 2 to 6 percent slopes, eroded	68	625	70	2,200	28	1.9	1.5	180
Appling fine sandy loam, 6 to 10 percent slopes	65	600	65	2,150	26	1.7	1.4	175
Appling fine sandy loam, 6 to 10 percent slopes, eroded	60	525	60	2,100	23	1.5	1.3	155
Augusta fine sandy loam	65		55		35	2.4		190
Buncombe soils	45		45				.8	
Cecil sandy loam, 2 to 6 percent slopes	73	700	75	2,200	30	2.0	1.5	190
Cecil sandy loam, 2 to 6 percent slopes, eroded	68	625	70	2,100	28	1.9	1.5	185
Cecil sandy loam, 6 to 10 percent slopes	65	600	65	2,050	26	1.7	1.4	180
Cecil sandy loam, 6 to 10 percent slopes, eroded	60	525	60	2,000	23	1.5	1.3	160
Cecil sandy loam, 10 to 15 percent slopes	55	475	58	1,900	20	1.3	1.3	160
Cecil sandy loam, 15 to 45 percent slopes								140
Cecil gravelly sandy loam, 2 to 6 percent slopes	73	700	75	2,200	30	2.0	1.5	190
Cecil gravelly sandy loam, 2 to 6 percent slopes, eroded	68	625	70	2,100	28	1.9	1.5	185
Cecil gravelly sandy loam, 6 to 10 percent slopes	65	600	65	2,050	26	1.7	1.4	180
Cecil gravelly sandy loam, 6 to 10 percent slopes, eroded	60	525	60	2,000	23	1.5	1.3	160
Cecil clay loam, 2 to 6 percent slopes, severely eroded	50	425	55	1,300			1.0	145
Cecil clay loam, 6 to 10 percent slopes, severely eroded	45	400	42	1,250			.9	130
Cecil clay loam, 10 to 20 percent slopes, severely eroded								120
Chewacla soils	85				35			200
Colfax sandy loam	55		55		28	1.9	1.2	180
Congaree fine sandy loam	90	650	75	[2] 2,400	30	2.0	1.6	210
Congaree silt loam	90	650	75	[2] 2,400	35	2.4	1.6	210
Creedmoor sandy loam, 2 to 6 percent slopes	60	525	60	2,300	25	1.7	1.4	170
Creedmoor sandy loam, 2 to 6 percent slopes, eroded	50	450	50	1,900	22	1.5	1.3	160
Creedmoor sandy loam, 6 to 10 percent slopes	50	425	50	2,000	20	1.3	1.1	155
Creedmoor sandy loam, 6 to 10 percent slopes, eroded	40	350	40	1,600	17	1.1	.9	145
Creedmoor sandy loam, 10 to 20 percent slopes	40	325	35	1,400	15	1.0	.8	135
Creedmoor silt loam, 2 to 6 percent slopes	60	525	60	2,100	28	1.9	1.4	170
Creedmoor silt loam, 6 to 10 percent slopes	50	425	50	1,900	23	1.5	1.1	155
Durham loamy sand, 2 to 6 percent slopes	70	550	62	2,300	30	2.0	1.6	180
Durham loamy sand, 2 to 6 percent slopes, eroded	65	525	58	2,200	28	1.9	1.5	175
Durham loamy sand, 6 to 10 percent slopes	65	525	58	2,150	26	1.7	1.4	165
Durham loamy sand, 6 to 10 percent slopes, eroded	60	475	53	2,100	23	1.5	1.3	155
Enon fine sandy loam, 2 to 6 percent slopes	54		54		28	1.9	1.4	170
Enon fine sandy loam, 2 to 6 percent slopes, eroded	45		45		25	1.7	1.3	160
Enon fine sandy loam, 6 to 10 percent slopes	45		45		23	1.5	1.1	155
Enon fine sandy loam, 6 to 10 percent slopes, eroded	36		36		21	1.4	.9	145
Enon fine sandy loam, 10 to 15 percent slopes, eroded							.6	125
Faceville sandy loam, 2 to 6 percent slopes	80	775	73	2,200	35	2.3	2.1	195
Faceville sandy loam, 2 to 6 percent slopes, eroded	75	750	70	2,100	32	2.2	2.0	190
Faceville sandy loam, 6 to 10 percent slopes, eroded	65	625	60	1,800	30	2.0	1.8	170
Georgeville silt loam, 2 to 6 percent slopes	68	600	68	1,900	28	1.9	1.5	180
Georgeville silt loam, 2 to 6 percent slopes, eroded	65	550	65	1,850	25	1.7	1.4	175
Georgeville silt loam, 6 to 10 percent slopes	60	525	60	1,750	23	1.5	1.4	170
Georgeville silt loam, 6 to 10 percent slopes, eroded	55	500	55	1,650	21	1.4	1.3	165
Georgeville silt loam, 10 to 15 percent slopes, eroded	50	450	50	1,450	17	1.1	1.2	150
Goldsboro sandy loam	80	675	65	2,350	37	2.5		
Granville sandy loam, 2 to 6 percent slopes	73	700	75	2,300	30	2.0	1.5	185
Granville sandy loam, 2 to 6 percent slopes, eroded	68	625	70	2,200	28	1.9	1.5	180
Granville sandy loam, 6 to 10 percent slopes	65	600	65	2,150	26	1.7	1.4	175
Granville sandy loam, 6 to 10 percent slopes, eroded	60	525	60	2,100	23	1.5	1.3	155
Granville sandy loam, 10 to 15 percent slopes	55	475	58	2,000	20	1.3	1.3	155
Gullied land								
Helena sandy loam, 2 to 6 percent slopes	60	525	60	2,100	25	1.7	1.4	170

See footnotes at end of table.

TABLE 2.—*Estimated average yields per acre of important crops grown under a high level of management*—Continued

Soils	Corn	Cotton (lint)	Oats	To-bacco (flue cured)	Soy-beans	Hay		Fescue-white clover pasture
						Soy-bean	Annual les-pedeza	
	Bu.	*Lb.*	*Bu.*	*Lb.*	*Bu.*	*Tons*	*Tons*	*Animal-unit-days* [1]
Helena sandy loam, 2 to 6 percent slopes, eroded	50	450	50	1, 900	22	1. 5	1. 3	160
Helena sandy loam, 6 to 10 percent slopes	50	425	50	1, 800	20	1. 3	1. 1	155
Helena sandy loam, 6 to 10 percent slopes, eroded	40	350	40	1, 600	17	1. 1	. 9	145
Helena sandy loam, 10 to 15 percent slopes	40	325	35	1, 400	15	1. 0	. 8	135
Herndon silt loam, 2 to 6 percent slopes	68	600	68	1, 900	25	1. 7	1. 5	180
Herndon silt loam, 2 to 6 percent slopes, eroded	65	550	65	1, 850	22	1. 5	1. 4	175
Herndon silt loam, 6 to 10 percent slopes	60	525	60	1, 750	20	1. 3	1. 4	170
Herndon silt loam, 6 to 10 percent slopes, eroded	55	500	55	1, 650	17	1. 1	1. 3	165
Herndon silt loam, 10 to 15 percent slopes, eroded	50	450	50	1, 450	13	. 9	1. 2	150
Herndon silt loam, 15 to 25 percent slopes								140
Lloyd loam, 2 to 6 percent slopes, eroded	70	525	70		28	1. 9	1. 5	175
Lloyd loam, 6 to 10 percent slopes, eroded	65	475	65		23	1. 5	1. 4	165
Lloyd loam, 10 to 15 percent slopes, eroded	60	425	60		15	1. 0	1. 2	155
Louisburg loamy sand, 2 to 6 percent slopes	40	400	50	1, 700	17	1. 1	. 9	125
Louisburg loamy sand, 6 to 10 percent slopes	30	325	40	1, 500	13	. 8	. 7	100
Louisburg loamy sand, 10 to 15 percent slopes								75
Louisburg-Wedowee complex, 2 to 6 percent slopes	50	450	55	1, 800	18	1. 2	1. 1	140
Louisburg-Wedowee complex, 2 to 6 percent slopes, eroded	45	400	50	1, 700	15	1. 0	1. 0	125
Louisburg-Wedowee complex, 6 to 10 percent slopes	40	375	45	1, 600	13	. 8	. 9	115
Louisburg-Wedowee complex, 6 to 10 percent slopes, eroded	35	325	40	1, 500	10	. 7	. 8	100
Lynchburg sandy loam	80	675	60	2, 300	40	2. 6	2. 0	190
Made land								
Madison sandy loam, 2 to 6 percent slopes, eroded	65	575	65				1. 3	165
Madison sandy loam, 6 to 10 percent slopes, eroded	55	475	55				1. 1	140
Madison sandy loam, 10 to 15 percent slopes, eroded	50	450	50				1. 0	130
Madison sandy loam, 15 to 25 percent slopes, eroded							. 9	125
Mantachie soils	75	600	65					190
Mayodan sandy loam, 2 to 6 percent slopes	73	700	75	2, 300	30	2. 0	1. 5	185
Mayodan sandy loam, 2 to 6 percent slopes, eroded	68	625	70	2, 200	28	1. 9	1. 5	180
Mayodan sandy loam, 6 to 10 percent slopes	65	600	65	2, 150	26	1. 7	1. 4	175
Mayodan sandy loam, 6 to 10 percent slopes, eroded	60	525	60	2, 100	23	1. 5	1. 3	155
Mayodan sandy loam, 10 to 15 percent slopes, eroded	50	450	55	1, 760	15	1. 0	1. 2	145
Mayodan sandy loam, 15 to 25 percent slopes							1. 1	145
Mayodan gravelly sandy loam, 2 to 6 percent slopes	73	700	75	2, 300	30	2. 0	1. 5	185
Mayodan gravelly sandy loam, 2 to 6 percent slopes, eroded	68	625	70	2, 200	28	1. 9	1. 5	180
Mayodan gravelly sandy loam, 6 to 10 percent slopes	65	600	65	2, 150	26	1. 7	1. 4	175
Mayodan gravelly sandy loam, 6 to 10 percent slopes, eroded	60	525	60	2, 100	23	1. 5	1. 3	155
Mayodan silt loam, thin, 2 to 6 percent slopes	73	700	75	2, 200	30	2. 0	1. 5	185
Mayodan silt loam, thin, 2 to 6 percent slopes, eroded	68	625	70	2, 100	28	1. 9	1. 5	180
Mayodan silt loam, thin, 6 to 10 percent slopes	65	600	65	2, 050	26	1. 7	1. 4	175
Mayodan silt loam, thin, 6 to 10 percent slopes, eroded	60	525	60	1, 950	23	1. 5	1. 3	155
Mayodan silt loam, thin, 10 to 15 percent slopes	55	475	58	1, 900	20	1. 3	1. 3	155
Norfolk loamy sand, 0 to 2 percent slopes	75	675	65	2, 500	35	2. 4		195
Norfolk loamy sand, 2 to 6 percent slopes	73	650	62	2, 450	32	2. 1		180
Norfolk loamy sand, 2 to 6 percent slopes, eroded	70	625	60	2, 300	30	2. 0		168
Norfolk loamy sand, 6 to 10 percent slopes	67	600	57	2, 200	28	1. 9		160
Norfolk loamy sand, 6 to 10 percent slopes, eroded	62	525	52	2, 000	25	1. 7		150
Orangeburg loamy sand, 2 to 6 percent slopes	75	675	65	2, 500	35	2. 4		195
Orangeburg loamy sand, 2 to 6 percent slopes, eroded	73	650	62	2, 450	32	2. 1		180
Orangeburg loamy sand, 6 to 10 percent slopes, eroded	70	625	60	2, 300	30	2. 0		168
Pinkston sandy loam, 0 to 10 percent slopes	35		45	1, 600			. 8	110
Pinkston sandy loam, 10 to 45 percent slopes								
Plummer sand								
Plains fine sandy loam	75	500	60	2, 000	35	2. 4		170
Roanoke fine sandy loam	45		45					155
Swamp								
Vance sandy loam, 2 to 6 percent slopes	60	525	60	2, 200	25	1. 7	1. 4	170
Vance sandy loam, 2 to 6 percent slopes, eroded	50	450	50	2, 100	22	1. 5	1. 3	160
Vance sandy loam, 6 to 10 percent slopes, eroded	40	350	40	1, 800	17	1. 1	. 9	145
Vagram loamy sand, 0 to 2 percent slopes	70	625	50	2, 400	25	1. 7	1. 1	
Vagram loamy sand, 2 to 6 percent slopes	65	590	45	2, 300	20	1. 3	1. 0	
Vagram loamy sand, 6 to 10 percent slopes	60	570	40	2, 200	18	1. 2	. 9	
Vagram-Troup sands, 0 to 4 percent slopes	45	325	45	1, 850	18	1. 2	. 7	
Vahee fine sandy loam	60		60					175
Vake soils, 2 to 10 percent slopes	30	300	40					
Vake soils, 10 to 25 percent slopes								
Vedowee sandy loam, 2 to 6 percent slopes	63	600	68	2, 000	25	1. 7	1. 5	180

See footnotes at end of table.

TABLE 2.—*Estimated average yields per acre of important crops grown under a high level of management*—Continued

Soils	Corn	Cotton (lint)	Oats	Tobacco (flue cured)	Soybeans	Hay		Fescue-white clover pasture
						Soybean	Annual lespedeza	
	Bu.	*Lb.*	*Bu.*	*Lb.*	*Bu.*	*Tons*	*Tons*	*Animal-unit-days* [1]
Wedowee sandy loam, 2 to 6 percent slopes, eroded	58	575	63	1,900	22	1.5	1.4	170
Wedowee sandy loam, 6 to 10 percent slopes	53	550	58	1,800	20	1.3	1.4	170
Wedowee sandy loam, 6 to 10 percent slopes, eroded	48	500	53	1,700	17	1.1	1.3	160
Wedowee sandy loam, 10 to 15 percent slopes, eroded	38	425	43	1,500	13	.9	1.2	140
Wedowee sandy loam, 15 to 25 percent slopes							1.2	130
Wehadkee silt loam	45							160
Wehadkee and Bibb soils:								
Wehadkee soil	45							160
Bibb soil	70							180
White Store sandy loam, 2 to 6 percent slopes	50	500	55	1,700	17	1.1	1.0	150
White Store sandy loam, 2 to 6 percent slopes, eroded	40	400	50	1,400	15	1.0	.9	140
White Store sandy loam, 6 to 10 percent slopes	45	425	50	1,500	13	.8	.9	140
White Store sandy loam, 6 to 10 percent slopes, eroded							.8	130
White Store sandy loam, 10 to 20 percent slopes							.8	130
White Store silt loam, 2 to 6 percent slopes	50	500	55		15	1.0	1.0	150
White Store clay loam, 2 to 15 percent slopes, severely eroded							.6	90
Wilkes soils, 2 to 10 percent slopes	45	375	55	1,600	16	1.0	.9	140
Wilkes soils, 10 to 20 percent slopes								115
Wilkes soils, 20 to 45 percent slopes								
Wilkes stony soils, 15 to 25 percent slopes								
Worsham sandy loam								155

[1] Animal-unit-days is a term used to express the carrying capacity of pasture. It is the number of animal units carried per acre multiplied by the number of days the pasture is grazed during a single grazing season without injury to the sod. An acre of pasture that provides 30 days of grazing for two cows has a carrying capacity of 60 animal-unit-days. An animal unit is one cow, one steer, or one horse; five hogs; or seven sheep or goats.

[2] Tobacco is grown only in areas that are not subject to overflow during the growing season.

Following are practices generally considered necessary to obtain the yields given in table 2:

1. Fertilizer and lime are applied according to the needs indicated by the results of soil tests.
2. High-yielding varieties of crops are grown.
3. Legumes are inoculated.
4. The soils are properly tilled, and the crops are properly cultivated.
5. Weeds, insects, and diseases are controlled.
6. Rotations that conserve moisture and protect the soils from erosion are used.
7. Runoff is adequately controlled.
8. Overgrazing is avoided, and the pastures are well managed.

The estimates given in the table are based on experience with the crops and soils of the county. They are also based on assumptions that the average amount of rainfall will be received over a long period of time, that no supplemental irrigation will be used, that adequate drainage will be provided and that no flooding or ponding will take place.

Use of the Soils as Woodland [4]

All of the land area that is now Wake County was originally covered by forests. For the most part, these forests were free of the dense, brushy undergrowth that is common in many wooded areas today, but some had an understory of shade-tolerant trees and shrubs, and of muscadine grapevines and other woody vines. Shortleaf, loblolly, longleaf, pond, and Virginia pines, eastern redcedar, baldcypress, Atlantic white-cedar, and a relict stand of eastern hemlock (*11*) were part of the original forests. Hickory, ash, maple, yellow-poplar, sweetgum, elm, black cherry, sycamore, black walnut, white basswood, blackgum, river birch, and American beech grew on the deep, moist soils of the flood plains, on the lower slopes, and in ravines. Growing in the understory of these hardwoods were flowering dogwood, American holly, redbud, sourwood, hophornbeam, blue beech, and mountain-laurel. On the uplands and high stream terraces were the hardwood forests consisting of hickory, oak, red maple, yellow-poplar, sweetgum, black walnut, persimmon, black cherry, and winged elm. Growing in the understory of these upland forests were dogwood, holly, sourwood, serviceberry, red mulberry, and redbud. Large numbers of loblolly and shortleaf pines were mixed in the overstory of these upland forests.

Longleaf pine grew on the well-drained to excessively drained soils in the southern part of the county. Trees in the understory of these forests included blackjack, post, and other scrub oaks. Baldcypress and swamp tupelo grew in swampy areas and along streams of the Coastal Plain. Associated with the cypress-tupelo forest type were Carolina ash, green ash, red maple, pond pine, occa-

[4] By JOHN E. WIGGINS, JR., forester, Soil Conservation Service, Raleigh, N.C.

sional Atlantic white-cedars, and other water-tolerant trees.

The original forests have been disturbed repeatedly since about 1745, when English and Scotch colonists began settling the territory. Nearly all of the tillable part of the county has been cleared at some time or other, and some areas have been cleared more than once. Many clearings originally made for wood products and for farming were later abandoned and then were restocked naturally with loblolly and shortleaf pines. Many of these second-growth stands have also been cleared to meet the demands for wood products or for farming. At the present time, slightly more than 57 percent of the land area in the county, or about 317,700 acres, is wooded. This includes the William B. Umstead State Park, which contains 5,100 acres of woodland. All non-park woodland is classed as commercial forest and is essentially all privately owned. Most of the privately owned forests are in tracts of less than 5,000 acres.

The original diverse kinds of forests and those found today in the county are the result, in part, of the many different kinds of soils and relief. These factors are interpreted in the following discussion to help the owner use and manage his soils properly.

Woodland suitability groups

The soils of Wake County have been placed in 14 woodland suitability groups to assist landowners in planning for the productive use of their soils and the management of their woodland. Each group is made up of soils that are about the same in water-supplying capacity and other major characteristics that affect the growth of trees. The soils within each group are also subject to similar hazards and have similar limitations that affect the planting, tending, and harvesting of trees. All soils in each group, therefore, have about the same potential productivity for trees and need about the same management and conservation practices. The names of soil series represented are mentioned in the description of each woodland suitability group, but this does not mean that all the soils of a given series are included in the group. To find the names of all the soils in any given woodland suitability group, refer to the "Guide to Mapping Units" in the back of this soil survey.

For each woodland group, the soils are briefly described and the preferred kinds of trees for producing sawtimber, pulpwood, veneer, other wood products, Christmas trees, and food for wildlife are named. Then, the site index range for each of several commercially important forest trees is given, and plant competition, seedling mortality, equipment limitations, and the hazards of erosion and windthrow are discussed.

Site index is the average total height, in feet, of the dominant and codominant trees in a well-stocked, even-aged stand at 50 years of age. It is a means of expressing the potential productivity of a soil for a given kind of tree. The ratings are based on many field measurements of the total average height and age of trees in existing forest stands on identified soils and on the results of forest research (*3, 4, 5, 6, 7, 10, 14*).[5]

[5] The ratings for yellow-poplar are based on 1957 data assembled by W. T. DOOLITTLE, Forest Service.

Ratings of the soils with respect to plant competition, seedling mortality, equipment limitations, and the hazards of erosion and windthrow are discussed in the following paragraphs.

PLANT COMPETITION.—This term refers to the degree to which undesirable plants are expected to invade a soil after the tree canopy is removed. The rating for plant competition reflects the degree to which these undesirable plants impede or prevent regeneration and growth of desirable species of trees on a given soil, either in a naturally occurring or in a planted stand. Where plant competition is unimportant, a rating of *slight* is given. A rating of *moderate* indicates that expected competition from undesirable plants will delay the establishment of an adequate stand of desired species of trees. A rating of *severe* indicates that competition from undesirable plants can prevent adequate restocking of the desirable species of trees, either in a naturally occurring or in a planted stand, without intensive preparation of the site and without weeding and other special maintenance practices.

SEEDLING MORTALITY.—This term refers to the expected degree of mortality of naturally occurring or planted tree seedlings, as influenced by the kinds of soils, when competition from other plants is not a factor. The rating is *slight* if ordinarily no more than 25 percent of the seedlings required to provide an initial full stocking may die. Natural regeneration is suitable, or an original planting can be expected to produce a satisfactory stand. A rating of *moderate* indicates that losses of seedlings will be between 25 and 50 percent. Natural regeneration cannot always be relied upon for adequate and immediate restocking, and planting may be a desirable alternative. A rating of *severe* means that more than 50 percent of the seedlings are likely to die and that adequate natural restocking is not expected, unless additional management is given. For example, use of superior planting techniques and of superior planting stock may be required, and replanting may be necessary, for assurance that the stand will be adequate.

EQUIPMENT LIMITATIONS.—Factors that limit the use of mechanical equipment normally used for woodland operations are referred to as equipment limitations. The dominant factors that limit the use of equipment are steepness of slope, wetness of the soils, rough terrain, and rocks or other obstacles. A soil rating of *slight* indicates that no particular factors limit the use of equipment. A rating of *moderate* indicates that not all types of equipment can be used and that there are periods of no more than 3 months when equipment cannot be used, because the soils are wet, have slopes that are greater than 15 to 25 percent, or are unstable. A rating of *severe* indicates that use of some kinds of equipment is limited; that special equipment may be needed; or that the soils are wet more than 3 months of the year, have slopes greater than 25 percent, or have unfavorable texture that limits the use of equipment.

EROSION HAZARD.—Potential erosion is rated to indicate the hazard of erosion as the result of woodland management. Steepness of slope is the major factor considered, but the characteristics of the soils also affect the rating. Generally, the rating is *slight* where the slopes are between 0 and 6 percent; *moderate* where the slopes

are between 6 and 10 percent; and *severe* where the slopes are steeper than 10 percent. These general rules regarding slope are modified where erodibility as a result of soil characteristics emphasizes or minimizes the factor of slope.

WINDTHROW HAZARD.—Ratings given for this hazard indicate the danger of trees being blown over by winds of high velocity. The ability of a tree to withstand wind is reflected by the soil characteristics that influence the development of the root system of the tree. A rating of *slight* indicates that no special hazard is recognized. A rating of *moderate* indicates that the root development of the designated tree species is adequate for stability, except during periods of excessive soil wetness and greatest wind velocity. A rating of *severe* indicates that the soils have prohibited development of a root system adequate for stability.

FOREST DISEASES AND INSECTS.—Hazards from forest diseases and insects are not discussed for all the woodland groups. They are discussed only where there is a relationship between the kind of soil and possible losses from forest diseases and insects.

WOODLAND SUITABILITY GROUP 1

This group consists of well-drained or somewhat poorly drained Chewacla and Congaree soils on first bottoms. These soils have a surface layer of fine sandy loam or silt loam and a subsoil of friable fine sandy loam to clay loam. Their permeability ranges from moderate to moderately rapid. The available water capacity is medium, and natural fertility and the content of organic matter are low. Water and tree roots easily penetrate to a great depth. Frequent flooding is the chief limitation to growing trees on these soils. It can cause loss of seedlings, and it impedes logging and other forest management.

Loblolly and shortleaf pines are the preferred species for pulpwood and saw logs, but yellow-poplar, black walnut, white ash, green ash, red oak, white oak, sweetgum, sycamore, and other desirable hardwoods also grow exceptionally well. Veneer logs and long-length poles and piling can be produced, and Eastern redcedar and Arizona cypress are suitable for production of Christmas trees. In addition to the species named as suitable for pulpwood, saw logs, and other purposes, oaks, hickories, black cherry, dogwood, and persimmon grow well on these soils. They produce food and cover for wildlife.

The site index is 95 to 105 for loblolly pine, and 85 to 95 for shortleaf pine. It is 100 to 115 for yellow-poplar, and 95 to 110 for sweetgum.

Plant competition is generally severe for pines and for yellow-poplar and other desirable hardwoods. Intensive treatment of the site, including disking, blading, or applying herbicides, is necessary in many places to eliminate or control undesirable vegetation prior to the time pines or desirable hardwoods are planted or seeded.

Seedling mortality is generally slight on these soils; more than 75 percent of planted seedlings generally survive. Yellow-poplar should not be planted where the soils are flooded for 3 days or longer in summer (*8*). Seedlings of this species are killed if they are submerged for periods longer than 3 days. Surface drainage is required in places to eliminate or reduce ponding. Ponding is a greater hazard on the Chewacla soils than on the Congaree. Satisfactory stocking generally can be obtained through natural reseeding if there is an adequate number of seed trees, and if competing plants are controlled.

Restrictions on the use of equipment commonly employed in managing the forests are considered moderate, and most areas of these soils are not readily accessible during wet periods. Logging equipment cannot be used in winter, especially on the Chewacla soils. Use of equipment during winter can cause serious damage to the roots of trees and to soil structure.

Erosion is only a slight hazard. Windthrow is not a hazard, except when winds are abnormally high.

WOODLAND SUITABILITY GROUP 2

This group consists of poorly drained soils of the Roanoke, Wehadkee, Bibb, and Worsham series. These soils are on first bottoms, on low terraces, and in draws or at the bases of slopes in the uplands. They have a surface layer of silt loam to sandy loam and a subsoil that ranges from very friable sandy loam to very firm clay. Permeability ranges from moderately rapid to slow, and the available water capacity, content of organic matter, and natural fertility are medium to low. Because of the high water table and, in some places, a very firm or plastic subsoil, roots of trees cannot penetrate these soils to a great depth.

Where these soils are on first bottoms or low terraces, they are subject to frequent flooding and water remains on or near the surface for a long time. Floodwaters prevent seeds from germinating or may drown seedlings, and they severely limit the use of equipment. Where these soils are in draws or on foot slopes, they are not subject to flooding from streams, but they receive surface runoff and seepage from soils at a higher elevation.

For the soils of this group, loblolly pine, green ash, Shumard and cherrybark oaks, yellow-poplar, sycamore, and swamp tupelo (swamp blackgum) are the preferred species. All the soils in this group are well suited to the growing of trees that can be harvested for pulpwood, saw logs, veneer bolts, or long-length poles and piling. All trees named are important sources of food for wildlife.

The site index is 85 to 95 for loblolly pine, sweetgum, and water oak. It is 85 to 100 for yellow-poplar.

Plant competition for pines and desirable hardwoods is generally severe. Unless they are eradicated or controlled, low-grade hardwoods, shrubs, and honeysuckle and other vines prevent the successful natural seeding or planting of desired species of trees. Intensive treatment of the site, including clearing, blading, disking, prescribed burning, and applying herbicides, is necessary to control the competing vegetation and to prepare a seedbed before desirable kinds of trees are planted.

Seedling mortality is moderate for most species grown on these soils, though prolonged flooding and silting during the growing season can result in severe mortality. Yellow-poplar and pines are especially vulnerable to excessive moisture. Controlled drainage and disposal of the excess water reduce mortality and improve the quality of the site.

Restrictions on the use of equipment are moderate to severe. Poor drainage and flooding limit the time that equipment can be used. Ditching and construction of roads are necessary on first bottoms and low terraces if those areas are to be made accessible for management and harvesting of the trees. Use of equipment should be avoided during wet periods to prevent compacting the soil and damaging the roots of trees.

Erosion and windthrow are not significant hazards on these soils.

WOODLAND SUITABILITY GROUP 3

Only one mapping unit, Buncombe soils, is in this woodland group. These soils are somewhat excessively drained loamy sands or sands on first bottoms that are subject to flooding. Permeability is rapid, and the available water capacity is low. Natural fertility and the content of organic matter are very low.

Loblolly pine is the preferred species for pulpwood or saw logs, but shortleaf pine is also suited. Yellow-poplar, sycamore, and other desirable hardwoods, once established, grow well on these soils.

The site index is 75 to 85 for loblolly pine and 55 to 65 for shortleaf pine.

Plant competition for pines and desirable hardwoods is generally moderate. Elimination or control of undesirable vegetation is necessary in places.

Seedling mortality caused by droughtiness is moderate to severe, and losses of seedlings are also caused by flooding and siltation. Extensive replanting is required in places. Natural reseeding cannot be relied upon to establish a fully stocked stand of desirable trees.

Equipment limitations are moderate. They result from the coarse texture and depth of these soils.

Erosion and windthrow are not significant hazards.

WOODLAND SUITABILITY GROUP 4

This group consists of moderately well drained or somewhat poorly drained soils of the Altavista, Augusta, Colfax, Goldsboro, Lynchburg, Mantachie, and Wahee series. These soils are nearly level or gently sloping and are on low stream terraces, in draws, or at the bases of slopes in the uplands. They have a surface layer of sandy loam to silt loam and a subsoil of sandy loam to clay that is friable to very firm. Permeability ranges from moderate to slow, and the available water capacity is medium. Natural fertility and the content of organic matter are low.

Loblolly, shortleaf, and longleaf pines, yellow-poplar, black walnut, white and green ash, red and white oaks, sweetgum, and sycamore are the preferred species on these soils. River birch and blackgum are considered less desirable. Eastern redcedar and Arizona cypress are suitable for Christmas trees. Blue beech, hophornbeam, and boxelder are weed trees. Nearly all of the species of trees named are important as a source of food and cover for wildlife.

The soils in this group are suitable for growing trees that can be harvested for pulpwood, saw logs, veneer logs, or poles and piling.

The site index is 85 to 95 for loblolly pine, slash pine, yellow-poplar, and sweetgum. It is 65 to 75 for shortleaf pine and longleaf pine and 75 to 85 for southern red oak.

Plant competition is severe for pines and desirable hardwoods. Intensive treatment of the site, including land clearing, disking, and applying herbicides, is needed in many places to eliminate or control competing vegetation and to prepare the site before desired species are seeded.

Seedling mortality as a result of soil influences is generally slight; at least 75 percent of the planted seedlings may be expected to survive. Where the number of seed trees is adequate, and where competing vegetation is controlled, a well-stocked stand can be obtained through natural regeneration.

Restrictions on the use of equipment are slight to moderate. Logging is usually restricted during wet periods. The Altavista, Augusta, and Wahee soils are subject to occasional overflow that interferes with management of the forests.

The hazard of erosion is slight. The hazard of windthrow is also slight, except when the velocity of the wind is exceptionally high.

Sweetgum is affected by dieback in long droughty periods.

WOODLAND SUITABILITY GROUP 5

This group consists of well-drained soils of the Appling, Cecil, Durham, Georgeville, Granville, Herndon, Lloyd, Madison, Mayodan, and Wedowee series. The texture of their surface layer ranges from loamy sand to clay loam, and the texture of their subsoil ranges from sandy clay loam to clay. In some places the surface layer is gravelly. Permeability is moderate, and the available water capacity is medium. Natural fertility and the content of organic matter are low. Most of these soils have slopes between 2 and 25 percent, but some have slopes as steep as 45 percent in places. The soils are mainly uneroded to moderately eroded, but some areas are severely eroded.

Loblolly pine is the preferred species for pulpwood, saw logs, or poles and piling. Shortleaf pine is also suited, but it grows more slowly than loblolly pine. Yellow-poplar, black walnut, sweetgum, and red and white oaks are the preferred species of hardwoods. Eastern redcedar and Arizona cypress are suitable for Christmas trees. Pines, Arizona cypress, redcedar, and privet are suitable for field windbreaks, where needed. Oaks, hickories, black cherry, persimmon, black walnut, beech, and American holly grow on these soils and provide food and cover for wildlife. Virginia pine is well suited to the dry, shallow soils.

On the uneroded to moderately eroded soils, the site index is 75 to 85 for loblolly pine, yellow-poplar, and sweetgum and 65 to 75 for shortleaf pine and southern red oak. In the severely eroded areas, the site index is 65 to 75 for loblolly pine and 55 to 65 for Virginia pine.

As a rule, plant competition for pines and desirable hardwoods is severe on the better soils and is slight to severe on the severely eroded soils. Where competition is severe, intensive preparation of the site is necessary before desired species are planted or seeded.

Seedling mortality is generally slight to moderate, but it can be severe in shallow, dry areas. Where adequate seed trees of desired species are present, and where competing vegetation is controlled, well-stocked stands can be obtained through natural regeneration. Some shallow

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areas will require intensive treatment if an adequately stocked stand is to be obtained. Applying a mulch and fertilizer and establishing a protective cover of grasses or of grasses and legumes are beneficial. Natural reseeding cannot be depended on to provide an adequately stocked stand of pine.

Equipment limitations are slight where the slopes are less than 15 percent, moderate where the slopes are between 15 and 25 percent, and severe where the slopes are steeper.

The hazard of erosion is slight on slopes of less than 6 percent, moderate on slopes between 6 and 10 percent, and severe on slopes of more than 10 percent. Unprotected steep slopes and roads built on a steep gradient are likely to be severely eroded unless special conservation measures are used. Where feasible, firebreaks and roads should be built along the contour.

Windthrow is a slight hazard on these soils.

WOODLAND SUITABILITY GROUP 6

This group consists of well-drained, nearly level or gently sloping soils of the Faceville, Norfolk, and Orangeburg series. These soils have a sandy loam or loamy sand surface layer and a friable to firm subsoil. Permeability of the subsoil is moderate, and the available water capacity is medium. Organic matter content and natural fertility are low. Water and tree roots easily penetrate these soils.

Loblolly and slash pines are the preferred species for pulpwood and saw logs, but longleaf pine is also suited. Yellow-poplar, black walnut, oak, sweetgum, and other hardwoods grow well on these soils. Eastern redcedar and Arizona cypress are suitable for Christmas trees. Redcedar, Arizona cypress, cherry laurel, privet, and photinia are suitable understory species for field windbreaks. Blackgum, red mulberry, persimmon, American holly, and other tree species grow well on these soils and produce food and cover for wildlife.

The site index is 85 to 95 for loblolly pine and slash pine, and 70 to 80 for longleaf pine and shortleaf pine. It is 85 to 100 for yellow-poplar, 85 to 95 for sweetgum, and 75 to 85 for southern red oak.

Plant competition for pines and desirable hardwoods from low-value hardwoods and other vegetation is generally moderate, but it is severe in places. Scrub oak, hickory trees, dogwood, sassafras, persimmon, red maple, sourwood, and blackgum retard the growth and development of pines and of yellow-poplar and other preferred broad-leaved species. Intensive treatment of the site, including disking, blading, or applying herbicides, is necessary in many places to eliminate or control vegetation prior to the time pines or desirable hardwoods are seeded or planted.

Seedling mortality resulting from the characteristics of the soils is generally slight. Satisfactory stocking from natural reseeding is usually obtained where an adequate number of pine seed trees is present, and where competing vegetation is controlled.

Equipment limitations are slight in areas where the slopes are no greater than 10 percent. In those areas the hazard of water erosion is slight, but the protective ground cover should be disturbed as little as possible by logging and other operations. Where feasible, locating firebreaks and access roads on the contour is desirable.

Wind erosion is a hazard in large open areas. In those places ryegrass or a similar cover crop can be used to protect seedlings planted for windbreaks.

Windthrow is not a hazard, except when winds are unusually strong.

Damage to loblolly pine from infestations of the Nantucket pine tipmoth (*Rhyacionia frustrana* (Comst.)) can be severe on these soils.

WOODLAND SUITABILITY GROUP 7

The only soil in this group is Rains fine sandy loam. It is nearly level, is poorly drained, and is in depressions or at the bases of slopes in Coastal Plain uplands. In wet seasons this soil receives runoff and seepage from higher surrounding areas. The subsoil is friable and has a texture of sandy loam to clay loam. The organic matter content and available water capacity are medium. Natural fertility is low.

Loblolly pine and slash pine are the preferred species in areas that have been drained, but longleaf pine is also suitable. Baldcypress, swamp tupelo, green ash, and water and willow oaks are adapted species in undrained areas. Most trees that are suitable for this soil also provide food and cover for wildlife. This soil is suitable for growing trees that can be harvested for pulpwood, saw logs, or long-length poles and piling.

The site index is 85 to 95 for loblolly pine, slash pine, and sweetgum. It is 70 to 80 for longleaf pine.

Plant competition is severe for pines and desirable hardwoods. Gallberry, vines, reeds (switchcane), undesirable hardwoods, and other plants interfere with the establishment and growth of pines and desirable broad-leaved species. Disking, clearing, prescribed burning, cutting of brush, or the application of herbicides is necessary in many places to eradicate unwanted vegetation before desirable species are planted or seeded.

Seedling mortality of pines is generally slight in areas that have been drained, but it is severe in depressions or ponded areas because of the excess water. Losses caused by excess water can exceed 50 percent, and natural regeneration cannot be depended on to establish a well-stocked stand. Controlled drainage, intensive preparation of the site, and superior planting techniques are needed if a well-stocked stand is to be obtained.

Ponding and a high water table severely limit the use of equipment. Water is on or near the surface most of the time. Controlled drainage is necessary in many areas to provide and maintain access roads. Drainage can be costly, however, because suitable outlets are not always available.

Erosion and windthrow are not hazards on this soil.

WOODLAND SUITABILITY GROUP 8

The only soil in this group, Plummer sand, is poorly drained and occurs mainly in draws and depressions on Coastal Plain uplands. Water stands on the surface of this soil for long periods each year. The surface layer is sand that is 40 to 60 inches thick. The subsoil is sandy loam to sandy clay loam. Permeability is rapid, and the available water capacity is low. Natural fertility and the content of organic matter are low.

Where drainage is adequate, loblolly and slash pines are the preferred species for this soil, but longleaf pine is also suitable. Pond pine, Atlantic white-cedar, baldcypress, sweetgum, swamp tupelo, green ash, and red maple can be grown in areas where water stands on the surface for a long time. This soil is suitable for growing trees that can be harvested for pulpwood and saw logs. Trees can also be grown for medium- to long-length poles and piling where drainage is adequate. Most trees that grow on this soil provide food and cover for wildlife.

The site index is 85 to 95 for loblolly pine, slash pine, and sweetgum. It is 75 to 85 for longleaf pine.

Desirable species of trees are subject to competition from undesirable hardwoods, vines, briers, switchcane, and other plants. Clearing, disking, cutting of brush, applying herbicides, and draining excess water are needed to control competing vegetation and to prepare a site for a new stand.

Seedling mortality is generally slight in areas that have been drained, but it is severe in ponded areas, where losses can exceed 50 percent. Natural reseeding cannot be depended upon to establish an adequately stocked stand of the preferred species of trees. Intensive preparation of the site, superior planting techniques, and management of water are necessary if a well-stocked stand is to be obtained.

Restrictions on the use of equipment are moderate in the areas that have been drained and severe in undrained areas. Management of water is necessary if access to the areas is to be obtained, and if roads are to be maintained. Because of the lack of suitable outlets, some areas are difficult to drain. Also, some roads may be hard to maintain because the coarse texture of the soil causes undercutting and caving of ditches.

Erosion is not a hazard, and windthrow is generally not a hazard.

WOODLAND SUITABILITY GROUP 9

The soils in this group are in the Wagram series. They are nearly level to sloping and occur on Coastal Plain uplands. Their surface layer is 20 to 30 inches thick and consists of loamy sand. Their subsoil is friable or very friable sandy loam to sandy clay loam. Permeability is moderate. Natural fertility, the content of organic matter, and the available water capacity are low. Water and the roots of trees easily penetrate these soils.

Loblolly and slash pines are the preferred species on these soils, but longleaf pines are also suitable. The soils are suitable for growing trees that can be harvested for pulpwood, saw logs, or medium-length poles and piling. Eastern redcedar and Arizona cypress are suitable for the production of Christmas trees. Cherry laurel, redcedar, Arizona cypress, and privet are suitable as understory species where field windbreaks are needed. Oak, hickory, dogwood, red mulberry, black cherry, blackgum, and persimmon growing on these soils provide food and cover for wildlife.

The site index is 75 to 85 for loblolly and slash pines. It is 65 to 75 for longleaf pine.

Moderate competition from oaks, hickories, blackgums, sassafras, and other hardwoods interferes with the growth of pines on these soils. Clearing, disking, cutting of brush, or applying herbicides may be necessary to control undesirable vegetation and to prepare the site where pines are to be planted or seeded.

Seedling mortality is generally slight, but it is moderate in some years. Large areas in which seedlings have not survived should be replanted. Natural reseeding is adequate, as a rule, if enough seed trees are present, if the site is properly prepared, and if competing vegetation is controlled.

Restrictions to the use of equipment are slight on slopes of up to 10 percent. Machinery can be used at any time without causing must damage to the roots of trees or to the structure of the soils. Equipment is subject to excessive wear on these soils, however, because of the abrasiveness of the sand.

The hazard of water erosion is slight on slopes of up to 10 percent. Some wind erosion occurs in large open areas. Young seedlings planted in field windbreaks should be protected from soil blowing by use of a cover crop. The hazard of windthrow is generally slight, except in abnormally high winds.

On these droughty soils, loblolly pine is sometimes deformed and retarded in growth by attacks from the Nantucket pine tipmoth. This damage occurs when the pine is a seedling or a sapling.

WOODLAND SUITABILITY GROUP 10

The only mapping unit in this group is Wagram-Troup sands, 0 to 4 percent slopes. These are somewhat excessively drained, nearly level to steep soils on Coastal Plain uplands. Their surface layer is sand that is 30 to 60 inches thick, and their subsoil is sandy loam to sandy clay loam. Permeability is moderate to rapid, and the available water capacity is low or very low. Natural fertility and the content of organic matter are very low.

Slash pine and longleaf pine are the preferred species on these soils. Loblolly pine is also suitable.

These soils are suitable for growing the preferred species of trees to a size suitable for pulpwood, small saw logs, or medium-length poles and piling. Eastern redcedar and Arizona cypress are suitable species to plant for Christmas trees and as understory species in field windbreaks. Cherry laurel is suitable in field windbreaks, both as an understory and as an overstory species. Oaks are an important source of food for wildlife, but only a limited amount of acorns is produced on these soils.

The site index is 75 to 85 for slash pine, 70 to 80 for loblolly pine, and 60 to 70 for longleaf pine.

Where pines are grown on these soils, plant competition is severe from blackjack oak, turkey oak, and other scrub oaks and wiregrass. Disking, clearing, undercutting, and other intensive treatment is generally needed to control competing vegetation and to prepare a site for regeneration of the preferred species.

Seedling mortality is generally moderate. Losses of seedlings are caused by an inadequate supply of moisture and by high temperature of the soil surface. Natural reseeding cannot be relied upon to obtain an adequately stocked stand of the preferred species. Seedlings of high quality and superior planting techniques are required

for satisfactory survival of the plants. Even then, some replanting may be necessary.

Limitations to the use of equipment are moderate on slopes of up to 6 percent. These loose sands give poor traction to light, rubber-tired equipment. They do not provide good support for heavy machinery. Therefore, extra power is required. Furthermore, machinery used on these soils is subject to excessive wear because of the abrasiveness of the sand.

Water erosion is not a hazard where the slopes are no greater than 6 percent, but soil blowing is a hazard in large open areas. Wind strips are necessary to protect some planted seedlings. Normally, windthrow is not a hazard.

The root rot fungus (*Fomes annosus*) is a serious hazard where pines and redcedar are grown on these soils. Seedlings and saplings of loblolly pine are subject to severe damage by the Nantucket tipmoth.

WOODLAND SUITABILITY GROUP 11

This group consists of well drained or moderately well drained soils of the Creedmoor, Enon, Helena, Vance, and White Store series. These soils are gently sloping or moderately sloping and are on Piedmont uplands. The texture of their surface layer ranges from sandy loam to clay loam, and their subsoil is friable to firm sandy clay loam to clay. Most areas are uneroded or moderately eroded, but one of the White Store soils that occupies a small acreage is severely eroded. Natural fertility is low to medium, and the content of organic matter is low. Permeability is slow, and the available water capacity is medium to high. Root penetration is restricted in areas that are underlain by a very firm, plastic subsoil.

Loblolly pine is the preferred species on these soils. Shortleaf pine also grows fairly fast, but the slow to medium internal drainage of these soils makes that species susceptible in some places to severe damage from littleleaf disease. Virginia pine is suited to the severely eroded White Store soil. The uneroded or moderately eroded soils are suitable for growing trees to sizes that can be harvested for pulpwood and saw logs, and trees grow larger on those soils than on the severely eroded soil. The severely eroded White Store soil is relatively low in productivity and has limitations to use for commercial growing of wood crops. Trees should be planted on this severely eroded soil, mainly to protect it from further erosion.

Eastern redcedar and Arizona cypress are suited to the production of Christmas trees. Oaks, hickories, blackgum, persimmon, American holly, black cherry, pine, and cedar growing on these soils provide food and cover for wildlife.

On the uneroded or moderately eroded soils, the site index is 75 to 85 for loblolly pine (fig. 14), yellow-poplar, and sweetgum and 60 to 70 for shortleaf pine. On the severely eroded White Store soil, the site index for loblolly pine is 65 to 75.

Where the soils are uneroded to moderately eroded, pines are subject to moderate to severe competition from undesirable hardwoods and other plants. In some places disking, blading, and the application of herbicides are necessary to control competing vegetation.

Seedling mortality is generally slight on the uneroded to moderately eroded soils. On those soils an adequately stocked stand usually can be obtained from natural seeding if enough seed trees are present, if the site is properly prepared, and if competing vegetation is controlled. Seedling mortality is moderate to severe on the severely eroded White Store soil. On that soil check dams, mulching, fertilization, and a protective cover of grasses and legumes are needed to obtain an adequately stocked stand. Natural seeding cannot be depended upon to reproduce a fully stocked stand.

Limitations to the use of equipment are slight on slopes of up to 15 percent, and they are moderate on slopes between 15 and 25 percent. On the severely eroded White Store soil, however, restrictions are moderate on the use of equipment during dry periods on slopes of 2 to 15 percent. They are severe where the slopes are more than 15 percent. In wet periods the use of equipment is severely restricted by the sticky and very plastic, clayey subsoil.

On the uneroded to moderately eroded soils, the hazard of water erosion is slight on slopes of up to 6 percent. It is moderate on slopes between 6 and 10 percent, and severe on slopes steeper than 10 percent. Firebreaks and roads should be run on the contour wherever feasible to protect them from erosion. A protective ground cover should be maintained insofar as possible. The hazard of erosion is serious on the severely eroded White Store soil. The hazard of windthrow is slight to moderate where the soils are uneroded to moderately eroded, but it is severe on the severely eroded White Store soil.

Littleleaf disease can severely damage shortleaf and loblolly pines.

WOODLAND SUITABILITY GROUP 12

In this group are soils of the Louisburg, Wedowee, Pinkston, Wake, and Wilkes series. These are well-drained to somewhat excessively drained, gently sloping to steep, shallow soils on Piedmont uplands. The texture of their surface layer is variable, and in some places the surface layer is stony. The subsoil is firm to loose loamy sand to clay loam. Depth to bedrock ranges from less than 20 inches to more than 50 inches. The content of organic matter is low, and natural fertility is low to medium. Permeability is moderate to rapid, and the available water capacity is low or very low. Bedrock limits the penetration of water and tree roots.

Loblolly pine is the preferred species for pulpwood and saw logs. Shortleaf pine is suitable on the more favorable sites. The deeper soils can be used for growing trees to sizes that can be harvested for pulpwood, saw logs, or poles and piling of medium length. The shallow and the steep soils should be given an onsite inspection to determine if trees should be planted and intensively managed for commercial wood products. As a rule, planting of trees in these areas is feasible only for controlling erosion and protecting the soils.

Arizona cypress and eastern redcedar are suitable for the production of Christmas trees and as understory trees in field windbreaks. These soils are not suited to the commercial production of hardwoods.

The site index is 70 to 80 for loblolly pine. It is 60 to 70 for shortleaf pine.

Figure 14.—**A well-managed stand of loblolly pine on Creedmoor sandy loam, 2 to 6 percent slopes, eroded. The trees have been thinned periodically to increase their growth and to improve their quality.**

Plant competition is slight to moderate where pines are grown, depending on the depth of the soil over bedrock. In places disking, girdling, and the application of herbicides are needed to control undesirable vegetation.

Seedling mortality is generally moderate, but it can be severe on the very shallow or on the steep soils. Seedlings of high quality and superior planting techniques are needed to adequately stock an area with pines, and replanting may be required. A well-stocked stand cannot be obtained through natural seeding.

Restrictions on the use of equipment are slight on slopes of up to 15 percent, moderate on slopes between 15 and 25 percent, and severe on slopes of more than 25 percent. Shallowness, a plastic subsoil, boulders, and rock outcrops can severely limit the use of equipment on all slopes. Operating heavy machinery during wet periods, especially on the Wilkes soils, can damage the structure of the soils and seriously injure the roots of trees.

The hazard of water erosion is slight on slopes of up to 2 percent. It is moderate on slopes between 2 and 6 percent and severe on slopes of more than 6 percent.

The development of roots is restricted by bedrock near the surface and by the droughtiness of these shallow soils. As a result, the hazard of windthrow is generally severe or very severe on these soils.

WOODLAND SUITABILITY GROUP 13

This group consists of three miscellaneous land types—Made land, Gullied land, and Borrow area. The texture and consistence of the soil material varies greatly from one area to another. The depth to which the roots of trees and water can penetrate is also widely variable.

Onsite investigation is required to determine how an area can best be managed for trees.

The potential productivity of these land types for trees varies widely. Where some surface soil remains, merchantable trees can be grown between the gullies. As a rule, however, the site indexes are very low for these land types. Loblolly pine and Virginia pine are the preferred species for planting, but redcedar is also suitable.

Competition from undesirable plants is generally slight where erosion is still active. Where a cover of plants has become established and the soil material is stabilized, plant competition is severe for the limited supply of moisture.

Seedling mortality, as a rule, is very severe on these land types, unless special preparation is given to the site. Land leveling, disking, construction of check dams, mulching, fertilization, and the establishment of a protective cover of grasses or of grasses and legumes are required if an adequate stand of trees is to be established, and erosion is to be controlled. Even where these practices are applied, extensive replanting is sometimes necessary. Seedlings must be planted by hand.

The use of most equipment is severely restricted by gullies. Erosion will continue to be a very severe hazard in the areas of Gullied land and in other gullied areas until a protective cover of plants is established. The hazard of windthrow is very severe for all kinds of trees.

In places loblolly pine "die out" and littleleaf disease are likely to be severe.

WOODLAND SUITABILITY GROUP 14

Swamp, a miscellaneous land type, is the only mapping unit in this group. It is very poorly drained and is under water most of the time. This land type is at the heads of manmade lakes, and it consists of variable soil material. Swamp tupelo, red maple, sweetgum, smooth alder, and other water-tolerant trees and shrubs are characteristic of the vegetation in areas of Swamp. If drainage and protection from flooding are provided, however, loblolly and slash pines can be grown. Interpretations on the potential productivity are not provided for this land type, because of the lack of information.

Use of the Soils for Wildlife [6]

The soils of Wake County produce food, cover, and protection for many kinds of wildlife. Doves, ducks, fox, quail, rabbit, squirrel, snipe, turkey, woodcock, and nongame birds are the most common kinds of wildlife in the county. Deer and geese are less numerous. Deer mainly frequent the northwestern corner of the county and scattered areas along bottoms of the Neuse River. A small flock of Canada geese spends the winter each year on Lake Wheeler.

Wood ducks, mallards, hooded mergansers, and black ducks are fairly numerous along the rivers, larger creeks, and swamps. The wood duck builds its nest in hollow trees along the rivers, near large creeks, and in the swamps. Greenwing teal, ringnecks, ruddy ducks, scaup, and widgeons inhabit the larger lakes and farm ponds in fall, in winter, and early in spring, and canvasbacks, buffleheads, gadwalls, mergansers, and pintails also visit those areas.

Two other game birds—the Wilson snipe and the woodcock—frequent areas of wetland in Wake County. These same areas of wetland provide habitat for such furbearers as beaver, mink, muskrat, and otter. Turkey, raccoon, and squirrel also share this habitat and are fairly common along wooded bottoms of streams and in other large tracts of woodland. Doves, fox, quail, and rabbit are abundant throughout most of the county.

Fishing is fair to excellent in the many farm ponds and lakes throughout the county, as well as in the large streams. Bass, bluegills, and shell crackers are the main kinds of fish in the farm ponds. Bass, bluegills, bullheads, crappies, channel catfish, pickerel, and red breasts and other kinds of sunfish inhabit the lakes and large streams.

The food of various kinds of wildlife differs widely. The abundance of a particular kind of wildlife depends, to a great extent, on the presence or absence of choice foods for that species. In the following paragraphs, the food and habitat requirements of the major kinds of wildlife are discussed.

BEAVER.—Beavers eat only food obtained from plants, mostly bark, roots, tender twigs, and green plants. Their favorite food is the tender bark, or cambium, of alder, ash, birch, cottonwood, hornbeam, maple, pine, sweetgum, and willow, but acorns and corn are also choice foods. In addition, beavers eat the tender shoots of elder, honeysuckle, grass, and weeds. The main feeding areas are within 150 feet of water.

BOBWHITE.—Bobwhites (quail) eat acorns, beechnuts, blackberries, browntop millet, wild black cherries, corn, cowpeas, dewberries, annual and shrub lespedezas, milo, mulberries, panicgrass, pecans, common ragweed, soybeans, pine seeds, and the fruits of flowering dogwood and sweetgum. They also eat many insects. Their food must be close to sheltering vegetation. Many kinds of habitat, including areas of woodland, brushy areas, areas of grassland, and open fields, are suitable for these gamebirds, but the best habitat is one that has a variety of cover types.

DEER.—Deer eat acorns, clover, cowpeas, greenbrier, honeysuckle, annual and shrub lespedezas, oats, rescuegrass, rye, ryegrass, soybeans, and wheat. They need an adequate supply of surface water for drinking, and wooded areas, 500 acres or more in size, for cover. Food plants for deer should be well limed and fertilized.

DOVE.—Doves eat browntop millet, corn, Japanese millet, pokeberry seeds, common ragweed, grain sorghum, the seeds of pine and sweetgum, and other kinds of seeds. Doves do not eat insects, green leaves, or fruits. They drink water daily. Doves prefer to land in open areas. Therefore, they need feeding areas and watering places free of tall grass or brush.

DUCK.—Ducks eat acorns, beechnuts, browntop millet, corn, Japanese millet, and smartweed, which must be covered by water to be readily available. Occasionally, ducks eat acorns and grain on dry land.

GEESE.—Geese feed in open fields and in shallow water. Their choice foods are the roots, stems, and leaves of aquatic plants, and wheat, corn, soybeans, and other grains. Geese graze on clover, pasture grasses, and young

[6] By E. R. SMITH, JR., biologist, Soil Conservation Service.

small grains. When they are not feeding, they rest on bodies of water.

Fox.—Foxes feed primarily on small animals, generally rodents, but they also eat apples, persimmons, acorns, cherries, grapes, corn, blueberries, and peanuts. The red fox prefers open fields and farmland for his habitat. The gray fox generally remains in wooded areas and in patches of dense brush.

Mink.—These furbearers feed on fish, reptiles, amphibians, birds, and small mammals. They live near water.

Muskrat.—Muskrats feed on cattails, bulrushes, burreeds, rushes, pondweeds, and many other aquatic plants. They also eat some corn, soybeans, and other crops. Ponds, lakes, marshes, swamps, and streams provide the habitat for these animals.

Otter.—Otters are primarily carniverous. Their principal food is fish, mainly coarse and undesirable species, and crayfish, water beetles, water birds, and clams. Occasionally, they eat water-loving mammals. Swamps, streams, and lakes are the habitat of otters.

Rabbit.—Rabbits eat clover, winter grasses, and other succulent vegetation. They also eat waste grain, bark, and twigs. Rabbits especially need cover, such as blackberry or plum thickets or patches of honeysuckle. Food plants that are well fertilized and limed are more attractive to rabbits than those that are not.

Raccoon.—Raccoons eat many kinds of foods. Among their favorite plant foods are acorns, chufa, greenbrier, grapes, persimmon, pokeberries, corn, hollyberries, and pecans. Favorite animal foods are frogs, crayfish, grasshoppers, insects, and small mammals. Raccoons inhabit bottom lands and swamps where den trees are plentiful.

Snipe.—The Wilson snipe feeds on earthworms and on the larval forms of many kinds of insects. This game bird returns to Wake County only in winter, and it lives in areas of wet grassland or marshes.

Squirrel.—These animals eat acorns, beechnuts, black cherries, black walnuts, corn, hickory nuts, mulberries, pecans, pine mast, and the seeds of blackgums and flowering dogwoods. The gray squirrel inhabits mixed stands of hardwoods and pines or pure stands of hardwoods. The fox squirrel is rare in this county. Its habitat is restricted to open stands of pines and hardwoods.

Turkey.—Turkeys thrive only in large areas of woodland, generally 1,000 acres or more in size. They need surface water daily for drinking. Turkeys often roost over water in the overhanging branches of large trees. Their choice foods are insects, acorns, beechnuts, blackberries, browntop millet, chufa, clover, corn, cowpeas, wild grapes, hackberries, mulberries, oats, paspalum seeds, pecans, pine mast, rescuegrass, rye, wheat, and the fruit of blackgum and flowering dogwood.

Woodcock.—The woodcock is primarily a migrant who visits this county in fall and winter. Woodcocks inhabit areas of wet woodland, where they probe the forest floor for earthworms, their choice food. These birds are rarely found in the open during the day.

Nongame Birds.—The food preferences of nongame birds differ widely. Several species eat nothing but insects; a few eat insects, nuts, and fruits; and others eat insects and seeds. Many desirable kinds of nongame birds, such as bluebirds, cardinals, robins, mockingbirds, and tanagers, can be attracted by planting dogwood, holly, Russian-olive, cherry-laurel, pokeberry, privet, pyracantha, multiflora rose, smooth sumac, and sunflowers.

Fish.—The choice foods of many fish are mostly aquatic worms and insects and their larvae. Bass, pickerel, large catfish, crappie, and other predators eat small fish. The abundance of such foods is directly related to the fertility of the water, and in a lesser degree, to the fertility of the soils at the bottom of the ponds and lakes.

Wildlife suitability groups

Most kinds of wildlife can be related to the soils in a two-step relationship. Each species is related to its choice foods, and, in turn, each plant is directly related to the soils.

In this subsection the soils of Wake County are placed in five groups, based on their capacity to produce plants that provide food for wildlife. The "Guide to Mapping Units" at the back of this survey lists the wildlife group for each of the soils.

In table 3 many of the plants used for food by wildlife are listed alphabetically and the suitability of each plant for the soils of four wildlife groups is rated. Wildlife group 5 is not included in this table, because the properties of the land types in this group are too variable for meaningful ratings to be assigned.

With a knowledge of each animal's food requirements and of the suitability of the soils for the growth of particular plants, the symbols on the soil map can be used as a guide to the selection of areas suitable for specified kinds of wildlife. The characteristics of the soils in each wildlife group that are significant to management for wildlife are described in the following paragraphs.

WILDLIFE SUITABILITY GROUP 1

This group consists of well drained or moderately well drained soils on terraces and on ridges and side slopes in the uplands. These soils are mainly gently sloping to strongly sloping, but they are nearly level in some places and are moderately steep or steep in others. They are in the Altavista, Appling, Cecil, Creedmoor, Durham, Enon, Faceville, Georgeville, Goldsboro, Granville, Helena, Herndon, Lloyd, Madison, Mayodan, Norfolk, Orangeburg, Vance, Wedowee, and White Store series. The texture of their surface layer ranges from loamy sand to silt loam, except that it is clay loam in severely eroded areas. Their subsoil is friable sandy loam to very firm clay. In places gravel is on and in the surface layer.

These soils have low to medium natural fertility and medium to high available water capacity. Surface runoff varies considerably because of differences in the texture of the soils, in the steepness of slopes, and in the kind of ground cover. The degree of erosion ranges from none to severe.

WILDLIFE SUITABILITY GROUP 2

This group consists of well-drained to somewhat poorly drained soils on first bottoms, on terraces, and in draws and depressions in the uplands. These soils are in the Augusta, Chewacla, Colfax, Congaree, Lynchburg, Mantachie, and Wahee series. The texture of their surface layer ranges from sandy loam to silt loam, and their subsoil is sandy loam to very firm clay.

TABLE 3.—*Suitability of plants for soils in four wildlife groups and as food for specified kinds of wildlife*

Food plants	Wildlife groups				Choice foods for—
	1	2	3	4	
Alder	Fair	Good	Good	Poor	Beaver.
Apple	Good	Fair	Poor	Fair	Fox, deer.
Ash	Fair	Good	Fair	Poor	Wood duck, beaver.
Bahiagrass	Good	Good	Fair	Fair	Turkey.
Beech	Good	Good	Poor	Poor	Bobwhite, duck, squirrel, turkey.
Blackberry and dewberry	Fair	Good	Fair	Fair	Bobwhite, turkey, nongame birds.
Black cherry	Good	Good	Fair	Fair	Bobwhite, squirrel, fox, nongame birds.
Blackgum	Fair	Good	Fair	Fair	Squirrel, turkey, nongame birds.
Blueberry	Fair	Good	Fair	Poor	Turkey, nongame birds.
Browntop millet	Good	Good	Fair	Poor	Bobwhite, dove, duck, turkey, nongame birds.
Chufa	Good	Good	Poor	Fair	Raccoon, turkey.
Clover, crimson	Good	Good	Poor	Poor	Deer, rabbit, turkey.
Clover, white	Good	Good	Poor	Poor	Deer, rabbit, turkey.
Corn	Good	Good	Fair	Poor	Bobwhite, dove, duck, raccoon, squirrel, turkey, nongame birds.
Cowpeas	Good	Good	Poor	Fair	Bobwhite, deer, turkey.
Cypress	Fair	Fair	Good	Poor	Squirrel.
Dogwood	Good	Fair	Poor	Fair	Bobwhite, squirrel, turkey, nongame birds.
Elderberry	Fair	Good	Fair	Poor	Nongame birds.
Fescue	Good	Good	Fair	Poor	Deer, rabbit, turkey.
Grape, wild	Good	Fair	Poor	Fair	Raccoon, turkey, nongame birds.
Greenbrier	Poor	Fair	Good	Poor	Deer, raccoon.
Blackberry	Good	Good	Fair	Poor	Turkey, squirrel, nongame birds.
Hickory	Good	Good	Poor	Poor	Squirrel.
Holly	Good	Good	Fair	Poor	Raccoon, nongame birds.
Honeysuckle	Good	Good	Fair	Poor	Deer, nongame birds.
Hornbeam	Fair	Good	Fair	Poor	Wood duck.
Japanese millet	Fair	Good	Fair	Poor	Dove, duck, nongame birds.
Lespedeza, annual	Good	Good	Poor	Poor	Bobwhite, deer.
Lespedeza, shrub	Good	Good	Poor	Poor	Bobwhite, deer.
Magnolia	Fair	Good	Fair	Poor	Squirrel, nongame birds.
Maple	Fair	Good	Good	Poor	Squirrel.
Mulberry	Good	Good	Poor	Poor	Bobwhite, squirrel, turkey, nongame birds.
Oak (post, blackjack, southern red, scarlet, black, and white).	Good	Good	Poor	Poor	Deer, duck, raccoon, squirrel, turkey, nongame birds.
Oak (swamp chestnut, water, willow)	Fair	Good	Fair	Poor	Deer, duck, raccoon, squirrel, turkey, nongame birds.
Oats	Good	Good	Fair	Poor	Deer, rabbit, turkey.
Paniegrass	Fair	Good	Fair	Poor	Bobwhite, dove, nongame birds, rabbit.
Paspalum (bull)	Fair	Good	Good	Poor	Bobwhite, dove, nongame birds.
Peanut	Good	Fair	Poor	Fair	Bobwhite, nongame birds.
Pecan	Good	Good	Poor	Fair	Bobwhite, raccoon, squirrel, turkey.
Persimmon	Good	Good	Fair	Fair	Raccoon.
Pine	Good	Good	Fair	Poor	Bobwhite, dove, squirrel, turkey, nongame birds.
Plum, chickasaw	Good	Good	Fair	Fair	Squirrel, bobwhite.
Poison-ivy	Good	Good	Fair	Fair	Rabbit, quail, nongame birds.
Pokeberry	Good	Good	Poor	Fair	Dove, raccoon, nongame birds.
Privet	Good	Good	Fair	Fair	Nongame birds.
Pyracantha	Good	Good	Poor	Poor	Nongame birds, turkey.
Ragweed	Good	Good	Fair	Fair	Bobwhite, dove, nongame birds.
Rescuegrass	Good	Good	Fair	Poor	Deer, turkey.
Russian-olive	Good	Fair	Poor	Poor	Nongame birds, turkey.
Rye	Good	Good	Poor	Poor	Deer, rabbit, turkey.
Ryegrass	Good	Good	Fair	Poor	Deer, rabbit.
Serviceberry	Fair	Good	Fair	Poor	Beaver, nongame birds.
Smartweed	Fair	Good	Fair	Poor	Duck.
Sorghum, grain	Good	Good	Poor	Poor	Bobwhite, dove, nongame birds.
Soybeans	Good	Good	Fair	Poor	Deer, rabbit.
Strawberry-bush	Good	Good	Fair	Poor	Deer, rabbit.
Sunflower	Good	Good	Poor	Poor	Dove, nongame birds, quail.
Sweetgum	Good	Good	Fair	Poor	Bobwhite, dove, nongame birds.
Tickclover	Good	Good	Poor	Poor	Bobwhite, turkey, nongame birds.
Wheat	Good	Good	Poor	Poor	Bobwhite, dove, deer, rabbit, turkey, nongame birds.
Walnut, black	Good	Good	Poor	Poor	Squirrel.
Yellow-poplar	Good	Good	Fair	Poor	Deer, squirrel.

These soils have low to medium natural fertility and medium available water capacity. Surface runoff is slow, and the degree of erosion is none to slight.

WILDLIFE SUITABILITY GROUP 3

This group consists of poorly drained or very poorly drained soils on first bottoms and low terraces and in upland draws and depressions. These soils are in the Plummer, Rains, Roanoke, Wehadkee, Bibb, and Worsham series, and the group also includes the mapping unit Swamp. The soils have a surface layer of sand to silt loam, and a subsoil of sandy loam to very firm clay.

Natural fertility is very low to medium, and the available water capacity is low to medium. Surface runoff is slow. These soils are commonly covered with water in winter and for short periods during other wet seasons.

WILDLIFE SUITABILITY GROUP 4

This group consists of well drained or somewhat excessively drained soils of uplands and first bottoms. These soils are in the Buncombe, Louisburg, Wedowee, Pinkston, Wagram, Troup, Wake, and Wilkes series. They have a surface layer of sand to silt loam, and their surface layer is underlain by sand to sandy clay. Some areas are stony, and in places gravel is on and in the surface layer.

These soils have very low to medium natural fertility and low or very low available water capacity. They are nearly level to steep. Surface runoff ranges from slow to rapid, and the degree of erosion ranges from slight to moderate.

WILDLIFE SUITABILITY GROUP 5

This group consists of three miscellaneous land types —Gullied land, Made land, and Borrow area—consisting of soils that have been altered greatly by erosion or by man. The soil texture and other soil characteristics are so variable from one area to another that onsite investigation is required to determine how an area can best be used for wildlife. If some of these areas are given special management, they produce habitat for wildlife, but results are generally poor.

Engineering Uses of the Soils [7]

Some soil properties are of special interest to engineers because they affect the construction and maintenance of roads, airports, pipelines, building foundations, facilities for water storage, erosion control structures, drainage systems, and sewage disposal systems. They also affect the suitability of materials for subgrade, road fill, and topsoil. The properties most important to the engineer are permeability to water, shear strength, compaction characteristics, soil drainage, shrink-swell characteristics, grain size, plasticity, pH, depth to the water table, and topography.

This soil survey contains information that can be used by engineers to—

1. Make studies that will aid in selecting and evaluating areas for developing industrial, business, residential, and recreational sites.
2. Make preliminary estimates of the engineering properties of soils in planning for agricultural drainage systems, farm ponds, irrigation systems, diversions, and terraces.
3. Make preliminary evaluations of soil and ground conditions that will aid in selecting locations for highways and airports and in planning detailed investigations for the selected locations.
4. Locate sources of construction materials.
5. Correlate the performance of engineering structures with soil mapping units so that information useful in designing and maintaining the structures can be obtained.
6. Determine the suitability of the soils for cross-country movement of vehicles and construction equipment.
7. Supplement information from other maps and reports and from aerial photographs for the purpose of making maps and reports that can be readily used by engineers.

With the soil map for identification of soil areas, the engineering interpretations reported here can be useful for many purposes. It should be emphasized, however, that these interpretations may not eliminate the need for sampling and testing at the site of specific engineering works involving heavy loads and where excavations are deeper than the depth of layers here reported. Even in these situations, the soil map is useful for planning more detailed field investigations and for suggesting the kinds of problems that may be expected.

Some of the terms used by the soil scientist may not be familiar to the engineer, and some words, for example, soil, clay, silt, and sand, have special meanings in soil science. Most of these terms are defined in the Glossary at the back of this survey.

To make the best use of the map and the text, the engineer should understand the classification system used by soil scientists. He should also have a knowledge of the properties of the soil material and the condition of the soil in place.

Much of the information in this section is in tables. Table 4 gives engineering test data obtained when samples of selected soil series were tested. Table 5 gives estimates of the properties of the soils, and table 6 provides engineering interpretations of these properties.

Engineering classification of soils

Most highway engineers classify soil materials according to the system used by the American Association of State Highway Officials (AASHO) (*1*). In this system soils are classified in seven principal groups. They range from A–1 (gravelly soils of high bearing capacity) to A–7 (clayey soils having low bearing capacity when wet). The relative engineering value of the soils within each group is indicated by group index numbers, which range from 0 for the best materials to 20 for the poorest. The group index numbers can be determined accurately only if the soils have been analyzed. The group indexes for the soils that have been analyzed are shown in table 4.

[7] S. T. CURRIN, civil engineer, Soil Conservation Service, assisted in writing this section.

TABLE 4.—*Engineering*

[Tests were performed by the North Carolina State Highway Commission, Department of Materials and Tests, Raleigh, N.C., under a the American Association of State

Soil name and location	Parent material	Report No.	Depth	Moisture density [1]	
				Maximum dry density	Optimum moisture
			In.	*Lb. per cu. ft.*	*Pct.*
Appling sandy loam:		*S64NC–92*			
In a forest 20 yds. S. of a private road; 1 mile N. and one-eighth of a mile E. of Bethany Church. (Modal profile)	Granitic gneiss.	12–1	0–5	120	11
		12–3	11–20	98	23
		12–8	44–50		
In a field 5 yds. N. of a paved road; 1 mile N. and 400 ft. E. of Bethany Church. (Shallower and finer textured than modal profile)	Quartz mica gneiss.	11–1	0–7	123	10
		11–4	13–20	85	32
		11–8	38–45	95	24
Appling gravelly sandy loam:		*S63NC–92*			
3 miles N. of junction of N.C. Highway No. 50 and U.S. Highway No. 70 near N.C. Highway No. 50. (Finer textured than modal profile)	Quartz mica gneiss.	5–1	0–4	119	11
		5–4	11–23	89	29
		5–7	43–48	103	20
Creedmoor sandy loam:					
N. of airport and near U.S. Highway No. 70. (Thicker than modal profile)	Triassic sediment.	4–1	0–6	114	11
		4–4	17–27	100	22
		4–5	27–40	92	23
		4–7	86–96	104	18
Durham loamy sand:		*S64NC–92*			
In a field 5 yds. S. of a gravel road, one-fourth of a mile E. of Bethany Church. (Thicker than modal profile)	Granite.	10–1	0–15	129	8
		10–3	18–30	107	18
		10–8	81–105	106	16
Madison sandy loam:		*S63NC–92*			
1.75 miles W. of the bridge across the Neuse River along N.C. Highway No. 98. (Thinner than modal profile)	Quartz mica schist.	6–1	1–5	117	14
		6–3	8–16	95	26
		6–5	24–48	101	21
1.75 miles NW. of Pleasant Union Church along dirt road. (Modal profile)	Quartz mica schist.	2–1	0–6	118	12
		2–3	9–19	87	32
		2–7	51–59	93	24
Mayodan gravelly sandy loam:					
West of N.C. Highway No. 55, and one-half mile N. of U.S. Highway No. 1. (Thicker than modal profile)	Triassic material.	3–1	0–7	132	6
		3–5	25–38	89	30
		3–7	55–84	88	31
White Store silt loam:					
One-half mile W. of Tom Jack Creek. (Modal profile)	Triassic siltstone.	1–2	2–8	109	15
		1–4	10–19	92	27
		1–9	40–43	116	14

[1] Based on AASHO Designation T 99–57, Methods A and C (*1*).

[2] Mechanical analyses according to AASHO Designation T 88–57 (*1*). Results by this procedure may differ somewhat from results obtained by the soil survey procedure of the Soil Conservation Service (SCS). In the AASHO procedure, the fine material is analyzed by the hydrometer method and the various grain-size fractions are calculated on the basis of all the material, including that coarser than 2 mm. in diameter. In the SCS soil survey procedure, the fine material is analyzed by the pipette method and the material coarser than 2 mm. in diameter is excluded from calculations of grain-size fractions. The mechanical analysis data used in this table are not suitable for use in naming textural classes for soils.

test data

cooperative agreement with the U.S. Department of Commerce, Bureau of Public Roads, in accordance with standard test procedures of Highway Officials (AASHO) (*1*)]

Mechanical analysis [2]										Liquid limit	Plasticity index	Classification	
Percentage passing sieve—						Percentage smaller than—							
1½-in.	¾-in.	No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)	0.05 mm.	0.02 mm.	0.005 mm.	0.002 mm.			AASHO [3]	Unified [4]
100	97	96	93	50	25	24	20	11	7	24	2	A–1–b(0)	SM
		100	99	77	62	62	61	54	48	64	29	A–7–5–(16)	MH
		100	98	79	58	57	51	38	35	63	20	A–7–5(11)	MH
		100	98	61	28	24	20	12	8	20	2	A–2–4(0)	SM
			100	92	82	81	79	75	71	74	33	A–7–5(20)	MH
			100	84	55	53	47	35	32	57	16	A–7–5(8)	MH
100	78	44	41	36	13	11	8	5	4	[5] NP	[5] NP	A–1–b(0)	GM
		100	99	95	77	76	74	68	65	66	35	A–7–5(20)	MH–CH
		100	95	88	58	54	46	38	36	48	24	A–7–6(11)	CL
			100	80	45	39	22	9	7	NP	NP	A–4(2)	SM
			100	91	79	76	64	50	44	69	43	A–7–6(20)	CH
			100	97	88	84	76	60	53	79	49	A–7–5(20)	CH
			100	92	76	73	61	34	23	43	18	A–7–6(12)	CL–ML
			100	60	24	22	18	10	6	11	NP	A–2–4(0)	SM
			100	64	49		49	44	42	53	21	A–7–5(8)	SM
			100	67	21	17	13	6	5	NP	NP	A–2–4(0)	SM
		100	96	85	28	24	20	14	10	22	NP	A–2–4(0)	SM
			100	93	65	65	64	52	49	66	36	A–7–5(17)	CH
		100	99	88	39	38	28	17	14	40	3	A–4(1)	SM
100	88	62	58	50	19	18	15	10	8	29	5	A–1–b	SM
		100	99	95	76	76	75	66	63	82	46	A–7–5(20)	CH–MH
			100	95	24	23	20	12	11	46	NP	A–2–5(0)	SM
100	78	42	40	29	11	9	6	3	2	NP	NP	A–1–a	GP–GM
			100	95	88	87	84	66	55	73	37	A–7–5(20)	MH
			100	97	91	90	88	62	50	81	43	A–7–5(20)	MH
		94	85	75	63	60	39	13	9	24	2	A–4(8)	ML
		100	99	97	95	95	92	69	60	80	47	A–7–5(20)	CH
		100	98	84	68	65	55	29	15	35	12	A–6(8)	CL–ML

[3] Based on AASHO Designation M 145–49 (*1*).

[4] Based on the Unified Soil Classification System, Technical Memorandum No. 3–357, v. 1 (*17*). SCS and BPR have agreed to consider that all soils having plasticity indexes within two points from A-line are to be given a borderline classification. An example of a borderline classification obtained by this use is CL–ML.

[5] Nonplastic.

TABLE 5.—*Estimated*

[Dashed lines in columns mean that soil properties are too variable for reliable estimates to be made. Miscellaneous land types

Soil series and map symbol	Depth to bedrock	Depth to seasonally high water table	Depth from surface (typical profile)	Classification: Dominant USDA texture
	Feet	*Feet*	*Inches*	
Altavista (AfA)	5–15+	2	0–13	Fine sandy loam
			13–42	Clay loam
			42–48	Coarse sandy loam
Appling (AgB, AgB2, AgC, AgC2, ApB, ApB2, ApC, ApC2, ApD, AsB, AsB2, AsC, AsC2).	5–15+	10+	0–11	Sandy loam or gravelly sandy loam
			11–44	Clay loam
			44–50	Sandy clay loam
Augusta (Au)	5–15+	1½	0–13	Fine sandy loam
			13–36	Sandy clay loam
			36–50	Fine sandy loam
Bibb (Mapped only in an undifferentiated unit with Wehadkee soils).	4–15+	0	0–36	Sandy loam
			36–42	Sand
Buncombe (Bu)	10+	2½	0–10	Loamy sand
			10–40	Sand
Cecil:				
(CeB, CeB2, CeC, CeC2, CeD, CeF, CgB, CgB2, CgC, CgC2).	5–15+	10+	0–6	Sandy loam or gravelly sandy loam
			6–59	Clay to clay loam
			59–72	Loam
(ClB3, ClC3, ClE3)	5–15+	10+	0–6	Clay loam
			6–40	Clay
			40–45	Loam
Chewacla (Cm)	4–15+	1½	0–6	Fine sandy loam
			6–48	Sandy loam to silt loam
Colfax (Cn)	5–15+	1½	0–19	Sandy loam
			19–36	Sandy clay loam
			36–45	Sandy loam
Congaree (Co, Cp)	5–15+	2½	0–32	Fine sandy loam
			32–42	Silt loam to loamy sand
Creedmoor (CrB, CrB2, CrC, CrC2, CrE, CtB, CtC)	5–10+	(1)	0–12	Sandy loam
			12–29	Sandy clay loam to clay loam
			29–58	Clay
			58–96	Clay to sandy clay
Durham (DuB, DuB2, DuC, DuC2)	5–15+	10+	0–18	Loamy sand
			18–60	Sandy clay loam to clay loam
			60–81	Sandy loam
Enon (EnB, EnB2, EnC, EnC2, EnD2)	4–10+	(1)	0–8	Fine sandy loam
			8–32	Clay
			32–38	Clay loam
Faceville (FaB, FaB2, FaC2)	20+	10+	0–14	Sandy loam
			14–65	Clay loam
			65–72	Sandy loam
Georgeville (GeB, GeB2, GeC, GeC2, GeD2)	5–15+	10+	0–5	Silt loam
			5–55	Clay to silty clay loam
			55–92	Silt loam
Goldsboro (Go)	20+	2½	0–15	Sandy loam
			15–61	Sandy clay loam
			61–72	Sandy loam
Granville (GrB, GrB2, GrC, GrC2, GrD)	5–15+	10+	0–12	Sandy loam
			12–41	Clay loam
			41–50	Clay

Footnote at end of table.

roperties of the soils

Tullied land (Gu), Made land (Ma), and Swamp (Sw) are omitted from this table because their properties are highly variable]

Classification—Continued		Percentage passing sieve No. 200 (0.074 mm.)	Permeability	Available water capacity	Reaction	Shrink-swell potential
Unified	AASHO		*Inches per hour*	*Inches per inch of soil*	*pH*	
SM, ML	A–4	40–55	2.0–6.3	0.12	5.6–6.0	Low.
CL	A–6	70–80	0.63–2.0	.13	5.6–6.0	Moderate.
SM	A–2, A–4	30–40	0.63–2.0	.11	5.1–5.5	Moderate.
SM, GM	A–2, A–1, A–4	10–40	>6.3	.08	5.1–5.5	Low.
MH, CL	A–6	50–85	0.63–2.0	.13	5.1–6.0	Moderate.
SC, CL, MH	A–2, A–4, A–6, A–7	40–65	0.63–2.0	.13	5.6–6.0	Moderate.
SM, ML	A–4, A–2	25–60	>6.3	.12	5.1–5.5	Low.
SC, CL	A–2, A–6	20–55	0.2–0.63	.13	4.5–5.0	Moderate.
SC, SM	A–4, A–2	20–50	0.2–0.63	.13	5.6–6.0	Moderate.
SM	A–2, A–4	25–45	2.0–6.3	.16	5.6–6.0	Low.
SP, SP–SM	A–1, A–3	0–12	>6.3	.05	5.6–6.0	Low.
SM	A–2, A–4	10–35	>6.3	.07	5.1–5.5	Low.
SP	A–1, A–3	0–5	>6.3	.05	5.1–5.5	Low.
SM, GC	A–2	25–35	0.63–6.3	.13	5.1–5.5	Low.
CL, MH	A–6, A–7	60–90	0.63–2.0	.14	5.1–6.0	Moderate.
ML, CL	A–4, A–6	50–80	0.63–2.0	.14	5.1–5.5	Moderate.
CL	A–6	55–85	0.63–2.0	.13	5.1–5.5	Low.
CL, MH	A–6, A–7	60–90	0.63–2.0	.14	5.1–5.5	Moderate.
ML, CL	A–4, A–6	50–80	0.63–2.0	.14	5.1–5.5	Moderate.
ML, SM	A–4	40–55	0.63–2.0	.15	5.1–5.5	Low.
SM, ML	A–2, A–4	30–100	0.63–2.0	.15	5.1–5.5	Moderate to low.
SM	A–2, A–4	30–40	2.0–6.3	.11	5.1–5.5	Low.
SC, CL	A–6, A–4, A–2	25–55	0.2–0.63	.12	5.1–5.5	Moderate.
SM	A–2, A–4	30–40	0.2–0.63	.12	5.1–5.5	Moderate.
SM	A–2	25–35	0.63–2.0	.15	5.1–5.5	Low.
ML, SM	A–4, A–2	15–90	0.63–2.0	.15	5.1–5.5	Moderate to low.
SM	A–2, A–4	30–45	2.0–6.3	.11	5.1–5.5	Low.
SC, CL, CH	A–6, A–7	35–85	0.63–2.0	.14	4.5–5.0	Moderate.
CH, MH	A–7	70–95	<0.2	.14	4.5–5.0	High.
CH, CL, SC	A–7	35–90	<0.2	.13	4.5–5.0	Moderate.
SM	A–2	10–35	>6.3	.12	5.6–6.0	Low.
SC, CL	A–6	35–80	0.63–2.0	.13	5.1–5.5	Moderate.
SM	A–2, A–4	30–40	0.63–2.0	.13	5.1–5.5	Moderate to low.
SM, ML	A–4	40–60	2.0–6.3	.12	5.6–6.0	Low.
MH, CH	A–7	70–90	<0.2	.14	6.1–6.5	High.
CL	A–6	55–85	<0.2	.14	6.1–6.5	Moderate.
SM, SC	A–2	25–35	2.0–6.3	.12	5.6–6.0	Low.
CL	A–6	55–85	0.63–2.0	.16	5.1–5.5	Moderate.
SC, SM	A–2, A–4	30–40	0.63–2.0	.16	5.1–5.5	Moderate.
ML	A–4	65–85	2.0–6.3	.13	5.6–6.0	Low.
MH	A–6, A–7	80–90	0.63–2.0	.16	5.1–6.0	Moderate.
ML	A–4	65–85	0.63–2.0	.11	5.1–5.5	Moderate.
SM	A–2, A–4	30–40	2.0–6.3	.10	6.1–6.5	Low.
SC, SM, CL	A–2, A–6	20–55	0.63–2.0	.15	5.1–5.5	Low.
SM	A–4, A–2	25–45	0.63–2.0	.15	5.1–5.5	Low.
SM	A–2, A–4	30–40	>6.3	.12	5.6–6.0	Low.
CL	A–6, A–7	55–85	0.63–2.0	.13	5.1–5.5	Moderate.
CL	A–7	70–90	0.63–2.0	.13	5.1–5.5	Moderate.

TABLE 5.—*Estimated properties*

Soil series and map symbol	Depth to bedrock	Depth to seasonally high water table	Depth from surface (typical profile)	Classification: Dominant USDA texture
	Feet	*Feet*	*Inches*	
Helena (HeB, HeB2, HeC, HeC2, HeD)	4–15+	(1)	0–8	Sandy loam
			8–36	Sandy clay
			36–39	Sandy clay loam
Herndon (HrB, HrB2, HrC, HrC2, HrD2, HrE)	5–15+	10+	0–6	Silt loam
			6–40	Silty clay loam
			40–45	Silty clay loam
Lloyd (LdB2, LdC2, LdD2)	5–15+	10+	0–9	Loam
			9–38	Clay to clay loam
			38–50	Silty clay loam
Louisburg (LoB, LoC, LoD, LwB, LwB2, LwC, LwC2). (For properties of Wedowee soils in LwB, LwB2, LwC, and LwC2, refer to the Wedowee series.)	2–4	10+	0–8	Loamy sand
			8–12	Coarse sandy loam
			12–36	Loamy sand
Lynchburg (Ly)	20+	1½	0–13	Sandy loam
			13–65	Sandy clay loam to sandy loam
			65–72	Clay
Madison (MdB2, MdC2, MdD2, MdE2)	5–15+	10+	0–6	Sandy loam
			6–32	Clay loam
			32–48	Silt loam
Mantachie (Me)	5–15+	2	0–45	Sandy loam
Mayodan: (MfB, MfB2, MfC, MfC2, MfD2, MfE, MgB, MgB2, MgC, MgC2.)	4–15+	10+	0–7	Sandy loam or gravelly sandy loam
			7–40	Clay to clay loam
			40–48	Sandy loam
(MyB, MyB2, MyC, MyC2, MyD)	3+	10+	0–9	Silt loam
			9–24	Silty clay loam
			24–30	Silt loam
Norfolk (NoA, NoB, NoB2, NoC, NoC2)	20+	10+	0–15	Loamy sand
			15–65	Sandy clay loam
			65–72	Sandy loam
Orangeburg (OrB, OrB2, OrC2)	20+	10+	0–12	Loamy sand
			12–66	Sandy clay loam to sandy loam
			66–72	Loamy sand
Pinkston (PkC, PkF)	2–3	10+	0–25	Sandy loam
			25–36	Gravelly sandy loam
			36	Hard rock.
Plummer (Ps)	20+	0	0–50	Sand
			50–60	Sandy loam
			60–72	Loamy sand
Rains (Ra)	20+	0	0–8	Fine sandy loam
			8–65	Sandy clay loam
			65–72	Loamy sand
Roanoke (Ro)	5–15+	0	0–11	Fine sandy loam
			11–38	Clay to sandy clay loam
			38–45	Sandy loam
Troup (Mapped only in a complex with Wagram soils).	20+	10+	0–49	Sand
			49–83	Sandy loam to sandy clay loam
			83–88	Loamy sand

Footnote at end of table.

of the soils—Continued

Classification—Continued		Percentage passing sieve No. 200 (0.074 mm.)	Permeability	Available water capacity	Reaction	Shrink-swell potential
Unified	AASHO					
			Inches per hour	*Inches per inch of soil*	*pH*	
SM	A–2, A–4	30–40	2. 0–6. 3	0. 11	5. 6–6. 0	Low.
MH, CL, SC	A–7	45–60	<0. 2	. 14	4. 5–5. 5	High.
CL, SC	A–6, A–2	20–55	0. 2–0. 63	. 14	5. 1–5. 5	High.
ML	A–4	65–90	2. 0–6. 3	. 13	5. 1–5. 5	Low.
CL, MH	A–6, A–7	85–95	0. 63–2. 0	. 16	5. 1–5. 5	Moderate.
CL	A–7	80–90	0. 63–2. 0	. 14	5. 6–6. 0	Moderate.
ML	A–4	50–80	2. 0–6. 3	. 13	5. 6–6. 0	Low.
CL, MH	A–7	55–90	0. 63–2. 0	. 13	5. 6–6. 0	Moderate.
MH	A–7	80–90	0. 63–2. 0	. 13	5. 6–6. 0	Moderate.
SM	A–2	10–35	>6. 3	. 08	5. 1–5. 5	Low.
SM, SC	A–1	10–25	2. 0–6. 3	. 10	5. 1–5. 5	Low.
SM	A–1	10–35	2. 0–6. 3	. 10	5. 1–5. 5	Low.
SM	A–2, A–4	30–40	2. 0–6. 3	. 12	5. 6–6. 0	Low.
CL, SM	A–6, A–2	25–60	0. 63–2. 0	. 14	5. 1–5. 5	Low.
CL	A–7	70–90	0. 63–2. 0	. 15	6. 1–6. 5	Moderate.
SM	A–2, A–4	25–40	>6. 3	. 11	5. 1–5. 5	Low.
MH, CH	A–7	55–85	0. 63–2. 0	. 13	5. 1–5. 5	Moderate.
ML	A–4	70–90	0. 63–2. 0	. 11	5. 1–5. 5	Low.
SM	A–2, A–4	30–40	2. 0–6. 3	. 09	6. 1–6. 5	Low.
SM, GM	A–2	12–35	>6. 3	. 12	5. 6–6. 0	Low.
MH, CL	A–7	70–90	0. 63–2. 0	. 13	5. 1–5. 5	Moderate.
SM	A–2, A–4	30–40	0. 63–2. 0	. 13	5. 1–5. 5	Low.
ML	A–4	65–90	2. 0–6. 3	. 13	5. 6–6. 0	Low.
ML, CL	A–6	80–90	0. 63–2. 0	. 13	5. 1–5. 5	Moderate.
ML	A–4	65–90	0. 63–2. 0	. 13	5. 1–5. 5	Moderate.
SM	A–2, A–4	30–40	2. 0–6. 3	. 08	5. 1–5. 5	Low.
SC, SM, CL	A–6, A–4, A–2	20–55	0. 63–2. 0	. 15	5. 1–5. 5	Low.
SM, SC	A–2, A–4	30–40	0. 63–2. 0	. 15	5. 6–6. 0	Low.
SM	A–2	10–35	2. 0–6. 3	. 08	5. 6–6. 0	Low.
SC	A–6, A–4, A–2	25–55	0. 63–2. 0	. 15	5. 1–5. 5	Low.
SM	A–2	10–35	0. 63–2 0	. 12	5. 1–5. 5	Low.
SC, SM	A–2, A–4	30–40	2. 0–6. 3	. 15	5. 6–6. 0	Low.
GM	A–2	10–35	2. 0–6. 3	. 08	4. 5–5. 0	Low.
SP, SM–SP	A–3, A–2	0–15	>6. 3	. 05	5. 6–6. 0	Low.
SM	A–2, A–4	30–40	2. 0–6. 3	. 12	5. 1–5. 5	Low.
SM	A–1, A–2	15–30	>6. 3	. 08	5. 1–5. 5	Low.
SM, ML	A–4	40–55	0. 63–2. 0	. 12	5. 6–6. 0	Low.
SC, CL	A–2, A–4, A–6	30–55	0. 63–2. 0	. 14	4. 5–5. 5	Low.
SM	A–2	15–30	0. 63–2. 0	. 12	4. 5–5. 0	Low.
SM, ML	A–2, A–4	25–60	0. 63–2. 0	. 13	6. 1–6. 5	Low.
MH, CL, SC	A–7, A–6	45–95	<0. 2	. 13	5. 1–5. 5	High to moderate.
SC, SM	A–4, A–2	30–40	<0. 2	. 13	6. 1–6. 5	Low.
SP, SW–SM	A–3, A–2	0–15	>6. 3	. 05	6. 1–6. 5	Low.
SM, CL	A–2, A–6	30–55	0. 63–2. 0	. 14	5. 1–5. 5	Low.
SM	A–2	15–30	2. 0–6. 3	. 10	5. 6–6. 0	Low.

TABLE 5.—*Estimated properties*

Soil series and map symbol	Depth to bedrock	Depth to seasonally high water table	Depth from surface (typical profile)	Classification: Dominant USDA texture
	Feet	*Feet*	*Inches*	
Vance (VaB, VaB2, VaC2)	4–10+	10+	0–5	Sandy loam
			5–29	Clay
			29–35	Clay loam
Wagram (WaA, WaB, WaC, WgA) (For properties of the Troup soil in WgA, refer to the Troup series.)	20+	10+	0–25	Loamy sand or sand
			25–65	Sandy clay loam
			65–100	Clay
Wahee (Wh)	5–15+	1½	0–14	Fine sandy loam, sandy clay loam
			14–36	Clay
			36–45	Fine sandy clay loam
Wake (WkC, WkE)	<20 inches	10+	0–15	Gravelly loamy sand
			15	Hard rock.
Wedowee (WmB, WmB2, WmC, WmC2, WmD2, WmE).	4– 6+	10+	0–7	Sandy loam
			7–24	Clay loam to sandy clay loam
			24–40	Sandy loam
Wehadkee (Wn, Wo) (For properties of the Bibb soil in Wo, refer to the Bibb series.)	3–15+	0	0– 6	Silt loam
			6–30	Fine sandy clay loam
			30–40	Sandy loam
White Store:				
(WsB, WsB2, WsC, WsC2, WsE, WtB)	4–8+	(1)	0–6	Sandy loam
			6–31	Clay
			31–35	Sandy clay to clay loam
(WvD3)		10+	0–5	Clay loam
			5–27	Clay
			27–38	Sandy clay to clay loam
Wilkes:				
(WwC, WwE, WwF)	2–4+	(1)	0–8	Sandy loam
			8–19	Clay to clay loam
			19–38	Silt loam
			38	Hard rock.
(WxE)		10+	0–8	Stony sandy loam
			8–15	Clay to clay loam
			15–24	Silt loam
			24	Hard rock.
Worsham (Wy)	5–15+	0	0–11	Sandy loam
			11–38	Sandy clay loam
			38–45	Sandy loam

[1] Has perched water table for short periods because subsoil is very slowly permeable.

Some engineers prefer to use the Unified Soil Classification System (*17*). In this system, soil materials are identified as coarse grained (eight classes), fine grained (six classes), or highly organic.

The classification of a soil by either the AASHO or the Unified system identifies the soil material with regard to gradation and plasticity. The classification permits the engineer to appraise the soil quickly by comparing it with other soils that have the same classification.

Soil test data

Samples of nine profiles, representing six soil series, were tested by the North Carolina State Highway Commission so that the soils could be evaluated for engineering purposes. The test data are given in table 4, and they indicate the characteristics of the soil at the specified location. The physical characteristics of each soil at other locations may vary somewhat from those of the soil sampled. All samples were obtained at a depth of less than 10 feet. The data, therefore, probably are not adequate for estimating the characteristics of soil materials in strongly sloping or steep areas, where deep cuts are required.

The engineering classifications in table 4 are based on data obtained by mechanical analyses and by tests made to determine liquid limit and plastic limit. Mechanical analyses were made by combined sieve and hydrometer methods.

The tests to determine plastic limit and liquid limit measure the effect of water on the consistence of the soil material. As the moisture content of a clayey soil increases from a very dry state, the material changes from a semisolid to a plastic state. As the moisture content is further increased, the material changes from a

of the soils—Continued

Classification—Continued		Percentage passing sieve No. 200 (0.074 mm.)	Permeability	Available water capacity	Reaction	Shrink-swell potential
Unified	AASHO					
			Inches per hour	*Inches per inch of soil*	*pH*	
SM	A-2, A-4	30-40	2. 0-6. 3	0. 11	5. 6-6. 0	Low.
CH, CL	A-7	70-90	<0. 2	. 13	5. 1-5. 5	Moderate.
ML, CH	A-6, A-7	55-85	<0. 2	. 13	5. 1-5. 5	Moderate.
SM, SP, SP-SM	A-2, A-3	0-35	>6. 3	. 08	5. 6-6. 0	Low.
CL, SC	A-6, A-4, A-2	20-55	0. 63-2. 0	. 15	4. 5-6. 0	Low.
CL	A-7	70-90	0. 63-2. 0	. 12	4. 5-5. 0	High.
ML, SM	A-4, A-2	25-60	0. 63-2. 0	. 12	6. 1-6. 5	Low.
MH, CL	A-7, A-6	70-90	<0. 2	. 13	5. 1-5. 5	High to moderate.
SC, CL	A-6, A-2	30-60	0. 2-0. 63	. 13	5. 6-6. 0	High to moderate.
GP-GM, SM	A-2	5-35	>6. 3	. 07	5. 1-5. 5	Low.
SM	A-2, A-4	30-40	>6. 3	. 08	5. 6-6. 0	Low.
SC, CL, MH	A-6, A-7	35-65	0. 63-2. 0	. 13	5. 1-5. 5	Moderate.
SM, SC, CL	A-2, A-4	25-55	0. 63-2. 0	. 13	5. 1-5. 5	Moderate.
ML	A-4, A-6	65-90	2. 0-6. 3	. 15	5. 1-5. 5	Low.
CL, SC	A-4, A-6, A-2	20-55	0. 63-2. 0	. 15	5. 1-5. 5	Low.
SM	A-2, A-4	30-40	2. 0-6. 3	. 13	5. 1-5. 5	Low.
SM	A-2, A-4	30-40	0. 63-2. 0	. 15	5. 1-5. 5	Low.
CH, MH	A-7	70-90	<0. 2	. 16	5. 1-5. 5	High.
CL, CH, SC	A-6, A-7	35-65	<0. 2	. 16	4. 5-5. 0	High.
CL	A-6	55-85	0. 63-2. 0	. 15	5. 6-6. 0	Low.
CH	A-7	70-90	<0. 2	. 16	5. 1-5. 5	High.
MH, CH, SC	A-4, A-7	35-65	<0. 2	. 16	4. 5-5. 0	High.
SM	A-2, A-4	30-40	>6. 3	. 12	6. 1-6. 5	Low.
CL, MH	A-7	55-90	0. 63-2. 0	. 15	6. 1-6. 5	Moderate.
ML, MH	A-7, A-6	70-90	0. 63-2. 0	. 15	6. 1-6. 5	Moderate.
SM, GM	A-2	12-35	>6. 3	. 12	6. 1-6. 5	Low.
CL, MH	A-7	55-90	0. 63-2. 0	. 15	6. 1-6. 5	Moderate.
ML, CL	A-4, A-6	70-90	----------	----------	6. 1-6. 5	
SM	A-2, A-4	30-40	0. 63-2. 0	. 13	5. 1-5. 5	Low.
SC, CL	A-6, A-2	35-55	0. 2-0. 63	. 16	5. 1-5. 5	Moderate.
SM	A-2, A-4	30-40	0. 2-0. 63	. 16	5. 1-5. 5	

plastic to a liquid state. The plastic limit is the moisture content at which the soil material passes from a semisolid to a plastic state. The liquid limit is the moisture content at which the material passes from a plastic to a liquid state. The plasticity index is the numerical difference between the liquid limit and the plastic limit. It indicates the range of moisture content within which a soil material is in a plastic condition.

Engineering properties of the soils

Table 5 gives some of the significant soil characteristics of the soils of the county. It also gives the engineering classification of the principal horizons of typical profiles. The depth to a seasonally high water table is based on field observations.

The soil material in the main horizons is classified according to textural terms used by the U.S. Department of Agriculture. Except for the soils listed in table 4, for which engineering test data are available, the classifications shown for the Unified and AASHO systems are estimates based on the USDA classification of texture and on the description of the soils.

The estimates of permeability are for uncompacted soil material. They are based on field observations and limited laboratory data.

Available water capacity refers to the water in the soil that is available to plants. It is the amount of water held in the soil between field capacity and the permanent wilting point; that is, between one-third atmosphere and 15 atmospheres of tension. The amounts are based on laboratory tests of a limited number of soils. For soils not tested, estimates are based on the results of testing similar soils.

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TABLE 6.—*Engineering*

[Dashed lines indicate that information is not available, or that the practice is not applicable. Miscellaneous land types Gullied land

Soil series and map symbols	Suitability as source of—		Degree of limitation for—		
	Topsoil	Road fill	Homebuilding sites	Septic tank absorption fields	Recreation: Campsites
Altavista (AfA)	Fair	Fair	Severe: flooding	Severe: flooding	Moderate: flooding; fair trafficability.
Appling: (AgB, AgB2)	Fair	Fair	Moderate: coarse fragments.	Moderate: medium percolation rate.	Moderate: coarse fragments.
(AgC, AgC2)	Fair	Fair	Moderate: coarse fragments.	Moderate: medium percolation rate.	Moderate: coarse fragments; slopes of 6 to 10 percent.
(ApB, ApB2, AsB, AsB2)	Fair	Fair	Slight	Moderate: medium percolation rate.	Slight
(ApC, ApC2, AsC, AsC2)	Fair	Fair	Slight	Moderate: medium percolation rate.	Moderate: slopes of 6 to 10 percent.
(ApD)	Fair	Fair	Moderate: slopes greater than 10 percent.	Moderate: medium percolation rate; slopes greater than 10 percent.	Severe: slopes greater than 10 percent.
Augusta (Au)	Poor	Poor	Severe: flooding; high water table.	Severe: flooding; high water table.	Severe: flooding; high water table.
Bibb (Mapped only in an undifferentiated unit with Wehadkee soils).	Poor	Fair	Severe: flooding; high water table.	Severe: flooding; high water table.	Severe: flooding; high water table; poor trafficability.
Buncombe (Bu)	Poor	Good	Severe: flooding	Severe: flooding	Severe: flooding
Cecil: (CeB, CeB2)	Fair	Fair	Slight	Moderate: medium percolation rate.	Slight
(CeC, CeC2)	Fair	Fair	Slight	Moderate: medium percolation rate.	Moderate: slopes of 6 to 10 percent.
(CeD)	Fair	Fair	Moderate: slopes of 10 to 15 percent.	Moderate: medium percolation rate; slopes of 10 to 15 percent.	Severe: slopes greater than 10 percent.
(CeF)	Fair	Fair	Moderate to severe: slopes of 15 to 45 percent.	Severe: slopes greater than 15 percent.	Severe: slopes greater than 15 percent.
(CgB, CgB2, CgC, CgC2)	Fair	Fair	Moderate: coarse fragments.	Moderate: medium percolation rate.	Moderate: coarse fragments.
(ClB3, ClC3)	Poor	Fair	Moderate: clayey surface layer.	Moderate: medium percolation rate.	Moderate: clayey surface layer.
(ClE3)	Poor	Fair	Moderate: clayey surface layer; slopes of 10 to 20 percent.	Moderate to severe: medium percolation rate; slopes of 10 to 20 percent.	Severe: slopes greater than 10 percent.

interpretations

(Gu), Made land (Ma), and Swamp (Sw) are omitted from this table, because their features are too variable for interpretations]

Degree of limitation for—Continued		Soil features affecting—			
Recreation—Continued		Highway location	Farm ponds		Sprinkler irrigation
Picnic areas	Intensive play areas		Reservoir area	Compacted embankment	
Moderate: fair trafficability; flooding.	Moderate: fair trafficability; flooding.	Seasonal high water table; flooding.	Moderate permeability.	Moderately low strength and stability; impervious.	Medium available water capacity.
Moderate: coarse fragments.	Moderate: coarse fragments.	Frost-susceptible material.	Moderate permeability.	Moderate strength and stability; nearly impervious or impervious.	Medium available water capacity.
Moderate: coarse fragments.	Moderate: coarse fragments; slopes of 6 to 10 percent.	Frost-susceptible material.	Moderate permeability.	Moderate strength and stability; nearly impervious or impervious.	Medium available water capacity.
Slight	Slight	Frost-susceptible material.	Moderate permeability.	Moderate strength and stability; nearly impervious or impervious.	Medium available water capacity.
Slight	Moderate: slopes of 6 to 10 percent.	Frost-susceptible material.	Moderate permeability.	Moderate strength and stability; nearly impervious or impervious.	Medium available water capacity.
Moderate: slopes greater than 10 percent.	Severe: slopes greater than 10 percent.	Frost-susceptible material.	Moderate permeability.	Moderate strength and stability; nearly impervious. or impervious.	Medium avaliable water capacity.
Severe; flooding; high water table.	Severe: flooding; high water table.	High water table; flooding; unstable ditch slopes.	Moderate permeability.	Moderate strength and stability; impervious.	Medium available water capacity.
Severe: flooding; high water table; poor trafficability.	Severe: flooding; high water table; poor trafficability.	High water table; flooding; unstable ditch slopes.	Moderately rapid permeability.	Moderate strength and stability; semipervious.	Low to medium available water capacity.
Severe: flooding	Severe: flooding; poor trafficability.	Flooding; unstable ditch slopes.	Rapid permeability.	Moderate strength and stability; pervious.	Low available water capacity.
Slight	Slight	Frost-susceptible material.	Moderate permeability.	Moderate to low strength and stability; nearly impervious.	Medium available water capacity.
Slight	Moderate: slopes of 6 to 10 percent.	Frost-susceptible material.	Moderate permeability.	Moderate to low strength and stability; nearly impervious.	Medium available water capacity.
Moderate: slopes of 10 to 15 percent.	Severe: slopes greater than 10 percent.	Frost-susceptible material.	Moderate permeability.	Moderate to low strength and stability; nearly impervious.	Medium available water capacity.
Moderate to severe: slopes of 15 to 45 percent.	Severe: slopes greater than 15 percent.	Frost-susceptible material.	Moderate permeability.	Moderate to low strength and stability; nearly impervious.	Medium available water capacity.
Moderate: coarse fragments.	Moderate: coarse fragments.	Frost-susceptible material.	Moderate permeability.	Moderate to low strength and stability; nearly impervious.	Medium available. water capacity.
Moderate: clayey surface layer.	Severe: clayey surface layer.	Frost-susceptible material.	Moderate permeability.	Moderate to low strength and stability; nearly impervious.	Medium available water capacity.
Moderate: clayey surface layer.	Severe: clayey surface layer.	Frost-susceptible material.	Moderate permeability.	Moderate to low strength and stability; nearly impervious.	Medium available water capacity.

TABLE 6.—*Engineering*

Soil series and map symbols	Suitability as source of—		Degree of limitation for—		
	Topsoil	Road fill	Homebuilding sites	Septic tank absorption fields	Recreation: Campsites
Chewacla (Cm)	Fair	Fair	Severe: flooding; high water table.	Severe: flooding; high water table.	Severe: flooding; high water table.
Colfax (Cn)	Fair	Fair	Severe: high water table.	Severe: high water table.	Severe: high water table.
Congaree (Co, Cp)	Good	Fair	Severe: flooding	Severe: flooding	Severe: flooding
Creedmoor:					
(CrB, CrB2, CtB)	Fair	Poor	Severe: shrink-swell potential.	Severe: slow percolation rate.	Moderate: fair trafficability.
(CrC, CrC2, CtC)	Fair	Poor	Severe: shrink-swell potential.	Severe: slow percolation rate.	Moderate: slopes of 6 to 10 percent; fair trafficability.
(CrE)	Fair	Poor	Severe: shrink-swell potential.	Severe: slow percolation rate.	Severe: slopes greater than 10 percent.
Durham:					
(DuB, DuB2)	Fair	Fair	Slight	Moderate: medium percolation rate.	Slight
(DuC, DuC2)	Fair	Fair	Slight	Moderate: medium percolation rate.	Moderate: slopes of 6 to 10 percent.
Enon:					
(EnB, EnB2)	Fair	Poor	Severe: shrink-swell potential.	Severe: slow percolation rate.	Moderate: fair trafficability.
(EnC, EnC2)	Fair	Poor	Severe: shrink-swell potential.	Severe: slow percolation rate.	Moderate: slopes of 6 to 10 percent; fair trafficability.
(EnD2)	Fair	Poor	Severe: shrink-swell potential.	Severe: slow percolation rate.	Severe: slopes greater than 10 percent.
Faceville:					
(FaB, FaB2)	Fair	Fair	Slight	Moderate: medium percolation rate.	Slight
(FaC2)	Fair	Poor	Slight	Moderate: medium percolation rate.	Moderate: slopes of 6 to 10 percent.
Georgeville:					
(GeB, GeB2)	Fair	Fair	Slight	Moderate: medium percolation rate.	Slight
(GeC, GeC2)	Fair	Fair	Slight	Moderate: medium percolation rate.	Moderate: slopes of 6 to 10 percent.
(GeD2)	Fair	Fair	Moderate: slopes greater than 10 percent.	Moderate: slopes greater than 10 percent; medium percolation rate.	Severe: slopes greater than 10 percent.
Goldsboro (Go)	Good	Good	Slight	Moderate: seasonally high water table.	Slight

interpretations—Continued

Degree of limitation for—Continued		Soil features affecting—			
Recreation—Continued		Highway location	Farm ponds		Sprinkler irrigation
Picnic areas	Intensive play areas		Reservoir area	Compacted embankment	
Severe: flooding; high water table.	Severe: flooding; high water table.	Flooding; high water table; unstable ditch slopes.	Moderate permeability.	Moderately low strength and stability; nearly impervious.	Medium to high available water capacity.
Severe: high water table.	Severe: high water table.	High water table; seepage; unstable ditch slopes.	Moderately slow permeability.	Moderate to low strength and stability; nearly impervious.	Medium available water capacity.
Moderate: flooding.	Severe: flooding.	Flooding; unstable ditch slopes.	Moderate permeability.	Moderately low strength and stability; semipervious.	Medium to high available water capacity.
Moderate: fair trafficability.	Moderate: fair trafficability.	Highly plastic.	Slow permeability.	Low strength and stability; impervious.	Medium to high available water capacity.
Moderate: fair traffiability.	Moderate: slopes of 6 to 10 percent; fair trafficability.	Highly plastic.	Slow permeability.	Low strength and stability; impervious.	Medium to high available water capacity.
Moderate: slopes of 10 to 20 percent; fair trafficability.	Severe: slopes greater than 10 percent.	Highly plastic.	Slow permeability.	Low strength and stability; impervious.	Medium to high available water capacity.
Slight.	Slight.	None.	Moderate permeability.	Moderate strength and stabllity; nearly impervious.	Medium available water capacity.
Slight.	Moderate: slopes of 6 to 10 percent.	None.	Moderate permeability.	Moderate strength and stability; nearly impervious.	Medium available water capacity.
Moderate: fair trafficability.	Moderate: fair trafficability.	Highly plastic material.	Slow permeability.	Low strength and stability; impervious.	Medium available water capacity.
Moderate: fair trafficability.	Moderate: slopes of 6 to 10 percent; fair trafficability.	Highly plastic material.	Slow permeability.	Low strength and stability; impervious.	Medium available water capacity.
Moderate: slopes of 10 to 15 percent; fair trafficability.	Severe: slopes greater than 10 percent.	Highly plastic material.	Slow permeability.	Low strength and stability; impervious.	Medium available water capacity.
Slight.	Slight.	None.	Moderate permeability.	Moderate strength and stability; nearly impervious.	Medium available water capacity.
Slight.	Moderate: slopes of 6 to 10 percent.	None.	Moderate permeability.	Moderate strength and stability; nearly impervious.	Medium available water capacity.
Slight.	Slight.	Unstable cut slopes; frost-susceptible material.	Moderate permeability.	Moderately low strength and stability; nearly impervious.	Medium available water capacity.
Slight.	Moderate: slopes of 6 to 10 percent.	Unstable cut slopes; frost-susceptible material.	Moderate permeability.	Moderately low strength; nearly impervious.	Medium available water capacity.
Moderate: slopes greater than 10 percent.	Severe: slopes greater than 10 percent.	Unstable cut slopes, frost-susceptible material.	Moderate permeabillty.	Moderately low strength and stability; nearly impervious.	Medium available water capacity.
Slight.	Slight.	Seasonally high water table.	Moderate permeability.	Moderate to moderately low strength and stability; nearly impervious.	Medium available water capacity.

TABLE 6.—*Engineering*

Soil series and map symbols	Suitability as source of—		Degree of limitation for—		
	Topsoil	Road fill	Homebuilding sites	Septic tank absorption fields	Recreation: Campsites
Granville:					
(GrB, GrB2)	Fair	Fair	Slight	Slight	Slight
(GrC, GrC2)	Fair	Fair	Slight	Slight	Moderate: slopes of 6 to 10 percent.
(GrD)	Fair	Fair	Moderate: slopes greater than 10 percent.	Moderate: slopes greater than 10 percent.	Severe: slopes greater than 10 percent.
Helena:					
(HeB, HeB2)	Fair	Poor	Severe: shrink-swell potential.	Severe: slow percolation rate.	Moderate: fair trafficability.
(HeC, HeC2)	Fair	Poor	Severe: shrink-swell potential.	Severe: slow percolation rate.	Moderate: slopes of 6 to 10 percent; fair trafficability.
(HeD)	Fair	Poor	Severe: shrink-swell potential.	Severe: slow percolation rate.	Severe: slopes greater than 10 percent.
Herndon:					
(HrB, HrB2)	Fair	Fair	Slight	Moderate: medium percolation rate.	Slight
(HrC, HrC2)	Fair	Fair	Slight	Moderate: medium percolation rate.	Moderate: slopes of 6 to 10 percent.
(HrD2)	Fair	Fair	Moderate: slopes of 10 to 15 percent.	Moderate: medium percolation rate; slopes of 10 to 15 percent.	Severe: slopes greater than 10 percent.
(HrE)	Fair	Fair	Moderate: slopes of 15 to 25 percent.	Severe: slopes greater than 15 percent.	Severe: slopes greater than 15 percent.
Lloyd:					
(LdB2)	Fair	Fair	Slight	Moderate: medium percolation rate.	Slight
(LdC2)	Fair	Fair	Slight	Moderate: medium percolation rate.	Moderate: slopes of 6 to 10 percent.
(LdD2)	Fair	Fair	Moderate: slopes greater than 10 percent.	Moderate: medium percolation rate; slopes of 10 to 15 percent.	Severe: slopes greater than 10 percent.
Louisburg:					
(LoB, LwB, LwB2) (For interpretations of the Wedowee soils in LwB and LwB2, refer to the Wedowee series.)	Fair	Fair	Moderate: depth to rock is 2 to 5 feet.	Severe: depth to rock is 2 to 5 feet.	Slight

terpretations—Continued

Degree of limitation for—Continued		Soil features affecting—			
Recreation—Continued		Highway location	Farm ponds		Sprinkler irrigation
Picnic areas	Intensive play areas		Reservoir area	Compacted embankment	
Slight	Slight	Unstable cut slopes	Moderate permeability.	Moderate to low strength and stability; nearly impervious.	Medium available water capacity.
Slight	Moderate: slopes of 6 to 10 percent.	Unstable cut slopes	Moderate permeability.	Moderate to low strength and stabiliy; nearly impervious.	Medium available water capacity.
Moderate: slopes greater than 10 percent.	Severe: slopes greater than 10 percent.	Unstable cut slopes	Moderate permeabiliy.	Moderate to low strength and stability; nearly impervious.	Medium available water capacity.
Moderate: fair trafficability.	Moderate: fair trafficability.	Highly plastic; frost-susceptible material; unstable slopes.	Slow permeability	Low strength and stability; impervious.	Medium available water capacity.
Moderate: fair trafficability.	Moderate: slopes of 6 to 10 percent; fair trafficability.	Highly plastic; frost-susceptible material; unstable slopes.	Slow permeability	Low strength and stability; impervious.	Medium available water capacity.
Moderate: slopes of 10 to 15 percent.	Severe: slopes greater than 10 percent.	Highly plastic; frost-susceptible material; unstable slopes.	Slow permeability	Low strength and stability; impervious.	Medium available water capacity.
Slight	Slight	Frost-susceptible material.	Moderate permeability.	Moderately low strength and stability; nearly impervious.	Medium available water capacity.
Slight	Moderate: slopes of 6 to 10 percent.	Frost-susceptible material.	Moderate permeability.	Moderately low strength and stability; nearly impervious.	Medium available water capacity.
Moderate: slopes greater than 10 percent.	Severe: slopes greater than 10 percent.	Frost-susceptible material.	Moderate permeability.	Moderately low strength and stability; nearly impervious.	Medium available water capacity.
Moderate: slopes greater than 15 percent.	Severe: slopes greater than 15 percent.	Frost-susceptible material.	Moderate permeability.	Moderately low strength and stability; nearly impervious.	Medium available water capacity.
Slight	Slight	Frost-susceptible material.	Moderate permeability.	Moderately low or low strength and stability; nearly impervious.	Medium available water capacity.
Slight	Moderate: slopes of 6 to 10 percent.	Frost-susceptible material.	Moderate permeability.	Moderately low or low strength and stability; nearly impervious.	Medium available water capacity.
Moderate: slopes greater than 10 percent.	Severe: slopes greater than 10 percent.	Frost-susceptible material.	Moderate permeability.	Moderately low or low strength and stability; nearly impervious.	Medium available water capacity.
Slight	Severe: rock	Rock	Moderately rapid permeability.	Moderate strength and stability; nearly impervious.	Low available water capacity.

TABLE 6.—*Engineering*

Soil series and map symbols	Suitability as source of—		Degree of limitation for—		
	Topsoil	Road fill	Homebuilding sites	Septic tank absorption fields	Recreation: Campsites
Louisburg—Continued					
(LoC, LwC, LwC2) (For interpretations of the Wedowee soils in LwC and LwC2, refer to the Wedowee series.)	Fair	Fair	Moderate: depth to rock is 2 to 5 feet.	Moderate: depth to rock is 2 to 5 feet.	Moderate: slopes of 6 to 10 percent.
(LoD)	Fair	Fair	Moderate: depth to rock is 2 to 5 feet; slopes greater than 10 percent.	Moderate: depth to rock is 2 to 5 feet.	Severe: slopes greater than 10 percent.
Lynchburg (Ly)	Fair to poor.	Good	Moderate: flooding; high water table.	Severe: flooding; high water table.	Moderate: high water table; fair trafficability.
Madison:					
(MdB2)	Fair	Fair	Slight	Moderate: medium percolation rate.	Slight
(MdC2)	Fair	Fair	Slight	Moderate: medium percolation rate.	Moderate: slopes of 6 to 10 percent.
(MdD2)	Fair	Fair	Moderate: slopes of 10 to 15 percent.	Moderate: medium percolation rate; slopes of 10 to 15 percent.	Severe: slopes greater than 10 percent.
(MdE2)	Fair	Fair	Moderate: slopes of 15 to 25 percent.	Severe: slopes greater than 15 percent.	Severe: slopes greater than 15 percent.
Mantachie (Me)	Fair to good.	Fair	Severe: flooding; high water table.	Severe: flooding; high water table.	Severe: high water table.
Mayodan:					
(MfB, MfB2)	Fair	Fair	Slight	Moderate: medium percolation rate.	Slight
(MfC, MfC2)	Fair	Fair	Slight	Moderate: medium percolation rate.	Moderate: slopes of 6 to 10 percent.
(MfD2)	Fair	Fair	Moderate: slopes greater than 10 percent.	Moderate: slopes of 10 to 15 percent.	Severe: slopes greater than 10 percent.
(MfE)	Fair	Fair	Moderate: slopes greater than 15 percent.	Severe: slopes greater than 15 percent.	Severe: slopes greater than 15 percent.
(MgB, MgB2, MgC, MgC2)	Poor	Fair	Moderate: coarse fragments.	Moderate: medium percolation rate.	Moderate: coarse fragments.
(MyB, MyB2)	Fair	Fair	Slight	Moderate	Slight
(MyC, MyC2)	Fair	Fair	Slight	Moderate	Moderate: slopes of 6 to 10 percent.

interpretations—Continued

Degree of limitation for—Continued		Soil features affecting—			
Recreation—Continued		Highway location	Farm ponds		Sprinkler irrigation
Picnic areas	Intensive play areas		Reservoir area	Compacted embankment	
Slight	Severe: rock	Rock	Moderately rapid permeability.	Moderate strength and stability; nearly impervious.	Low available water capacity.
Moderate: slopes greater than 10 percent.	Severe: slopes greater than 10 percent.	Rock	Moderately rapid permeability.	Moderate strength and stability; nearly impervious.	Low available water capacity.
Moderate: high water table; fair trafficability.	Moderate: high water table; fair trafficability.	Seasonally high water table.	Moderate permeability.	Moderate to low strength and stability; nearly impervious.	Medium available water capacity.
Slight	Slight	Frost-susceptible material.	Moderate permeability.	Moderate to low strength and stability; nearly impervious.	Medium available water capacity.
Slight	Moderate: slopes of 6 to 10 percent.	Frost-susceptible material.	Moderate permeability.	Moderate to low strength and stability; nearly impervious.	Medium available water capacity.
Moderate: slopes of 10 to 15 percent.	Severe: slopes greater than 10 percent.	Frost-susceptible material.	Moderate permeability.	Moderate to low strength and stability; nearly impervious.	Medium available water capacity.
Moderate: slopes of 15 to 25 percent.	Severe: slopes greater than 15 percent.	Frost-susceptible material.	Moderate permeability.	Moderate to low strength and stability; nearly impervious.	Medium available water capacity.
Severe: high water table.	Severe: high water table.	High water table; flooding.	Moderately rapid permeability.	Moderate strength and stability; nearly impervious.	Medium available water capacity.
Slight	Slight	Frost-susceptible material.	Moderate permeability.	Moderate to low strength and stability; nearly impervious.	Medium available water capacity.
Slight	Moderate: slopes of 6 to 10 percent.	Frost-susceptible material.	Moderate permeability.	Moderate to low strength and stability; nearly impervious.	Medium available water capacity.
Moderate: slopes of 10 to 15 percent.	Severe: slopes greater than 10 percent.	Frost-susceptible material.	Moderate permeability.	Moderate to low strength and stability; nearly impervious.	Medium available water capacity.
Moderate: slopes of 15 to 25 percent.	Severe: slopes greater than 15 percent.	Frost-susceptible material.	Moderate permeability.	Moderate to low strength and stability; nearly impervious.	Medium available water capacity.
Moderate: coarse fragments.	Moderate: coarse fragments.	Frost-susceptible material.	Moderate permeability.	Moderate to low strength and stability; nearly impervious.	Medium available water capacity.
Slight	Slight	Frost-susceptible material.	Moderate permeability.	Moderate to low strength and stability; nearly impervious.	Medium available water capacity.
Slight	Moderate: slopes of 6 to 10 percent.	Frost-susceptible material.	Moderate permeability.	Moderate to low strength and stability; nearly impervious.	Medium available water capacity.

TABLE 6.—*Engineering*

Soil series and map symbols	Suitability as source of—		Degree of limitation for—		
	Topsoil	Road fill	Homebuilding sites	Septic tank absorption fields	Recreation: Campsites
Mayodan—Continued (MyD)	Fair	Fair	Moderate: slopes greater than 10 percent.	Moderate	Severe: slopes greater than 10 percent.
Norfolk: (NoA, NoB, NoB2)	Fair	Good	Slight	Slight	Slight
(NoC, NoC2)	Fair	Good	Slight	Slight	Moderate: slopes of 6 to 10 percent.
Orangeburg: (OrB, OrB2)	Fair	Good	Slight	Slight	Slight
(OrC2)	Fair	Good	Slight	Slight	Moderate: slopes of 6 to 10 percent.
Pinkston: (PkC)	Fair	Fair	Moderate: depth to rock 2 to 5 feet.	Severe: depth to rock 2 to 5 feet.	Slight where slopes are 0 to 6 percent. Moderate where slopes are 6 to 10 percent.
(PkF)	Fair	Fair	Moderate where slopes are 10 to 25 percent; depth to rock 2 to 5 feet. Severe where slopes are greater than 25 percent.	Severe: depth to rock 2 to 5 feet.	Severe: slopes greater than 10 percent.
Plummer (Ps)	Poor	Fair	Severe: flooding; high water table.	Severe: flooding; high water table.	Severe: flooding; high water table.
Rains (Ra)	Fair	Fair	Severe: flooding; high water table.	Severe: flooding; high water table.	Severe: flooding; high water table.
Roanoke (Ro)	Poor	Poor	Severe: flooding; high water table.	Severe: flooding; high water table.	Severe: flooding; high water table.
Troup (Mapped only in a complex with Wagram soils.)	Poor	Fair	Slight	Moderate: rapid percolation rate; limited filtering action.	Slight
Vance: (VaB, VaB2)	Fair	Poor	Severe: shrink-swell potential.	Severe: slow percolation rate; shrink-swell potential.	Moderate: fair trafficability.
(VaC2)	Fair	Poor	Severe: shrink-swell potential.	Severe: slow percolation rate; shrink-swell potential.	Moderate: fair trafficability; slopes of 6 to 10 percent.
Wagram: (WaA, WaB, WgA) (For interpretations of the Troup soil in WgA, refer to the Troup series.)	Fair	Good	Slight	Slight	Slight

nterpretations—Continued

Degree of limitation for—Continued		Soil features affecting—			
Recreation—Continued		Highway location	Farm ponds		Sprinkler irrigation
Picnic areas	Intensive play areas		Reservoir area	Compacted embankment	
Moderate: slopes of 10 to 15 percent.	Severe: slopes greater than 10 percent.	Frost-susceptible material.	Moderate permeability.	Moderate to low strength and stability; nearly impervious.	Medium available water capacity.
Slight	Slight	None	Moderate permeability.	Moderate strength and stability; impervious.	Medium available water capacity.
Slight	Moderate: slopes of 6 to 10 percent.	None	Moderate permeability.	Moderate strength and stability; impervious.	Medium available water capacity.
Slight	Slight	None	Moderate permeability.	Moderate strength and stability; impervious.	Medium available water capacity.
Slight	Moderate: slopes of 6 to 10 percent.	None	Moderate permeability.	Moderate strength and stability; impervious.	Medium available water capacity.
Slight: slopes of 0 to 10 percent.	Severe: rock	Rock	Moderately rapid permeability.	Moderate strength and stability; pervious.	Low available water capacity.
Moderate where slopes are 10 to 25 percent. Severe where slopes are greater than 25 percent.	Severe: slopes greater than 10 percent; rock.	Rock	Moderately rapid permeability.	Moderate strength and stability; pervious.	Low available water capacity.
Severe: flooding; high water table.	Severe: high water table.	High water table; ditchbanks unstable.	Rapid permeability.	Moderate strength and stability; semipervious.	Low available water capacity.
Severe: flooding; high water table.	Severe: flooding; high water table.	High water table	Moderate permeability.	Moderate strength and stability; impervious.	Medium available water capacity.
Severe: flooding; high water table.	Severe: flooding; high water table.	High water table; flooding.	Slow permeability	Moderately low strength and stability; nearly impervious.	Medium available water capabity.
Slight	Moderate: fair trafficability.	Unstable cut slopes	Rapid permeability.	Moderate strength and stability; semipervious.	Very low available water capacity.
Moderate: fair trafficability.	Moderate: fair trafficability.	Frost-susceptible material.	Slow permeability	Moderately low strength and stability; impervious.	Medium available water capacity.
Moderate: fair trafficability.	Moderate: fair trafficability; slopes of 6 to 10 percent.	Frost-susceptible material.	Slow permeability	Moderately low strength and stability; impervious.	Medium available water capacity.
Slight	Slight	None	Moderate permeability.	Moderate to low strength and stability; nearly impervious.	Low available water capacity.

TABLE 6.—*Engineering*

Soil series and map symbols	Suitability as source of—		Degree of limitation for—		
	Topsoil	Road fill	Homebuilding sites	Septic tank absorption fields	Recreation: Campsites
Wagram—Continued (WaC)	Fair	Good	Slight	Slight	Moderate: slopes of 6 to 10 percent.
Wahee (Wh)	Poor	Poor	Severe: flooding; high water table.	Severe: flooding; high water table.	Severe: flooding; high water table.
Wake: (WkC)	Poor	Poor	Severe: shallow to rock.	Severe: shallow to rock.	Slight to moderate: slopes of 2 to 10 percent.
(WkE)	Poor	Poor	Severe: shallow to rock.	Severe: shallow to rock.	Severe: slopes greater than 10 percent.
Wedowee: (WmB, WmB2)	Fair	Fair	Slight	Moderate: medium percolation rate.	Slight
(WmC, WmC2)	Fair	Fair	Slight	Moderate: medium percolation rate.	Moderate: slopes of 6 to 10 percent.
(WmD2)	Fair	Fair	Moderate: slopes of 10 to 15 percent.	Moderate: slopes of 10 to 15 percent.	Severe: slopes greater than 10 percent.
(WmE)	Fair	Fair	Moderate: slopes of 15 to 25 percent.	Severe: slopes greater than 15 percent.	Severe: slopes greater than 15 percent.
Wehadkee (Wn, Wo) (For interpretations of the Bibb soil in Wo, refer to the Bibb series.)	Poor	Poor	Severe: flooding; high water table.	Severe: flooding; high water table.	Severe: flooding; high water table.
White Store: (WsB, WsB2, WtB)	Fair	Poor	Severe: shrink-swell potential.	Severe: slow percolation rate; shrink-swell potential.	Moderate: fair trafficability.
(WsC, WsC2)	Fair	Poor	Severe: shrink-swell potential.	Severe: slow percolation rate; shrink-swell potential.	Moderate: fair trafficability; slopes of 6 to 10 percent.
(WsE)	Fair	Poor	Severe: shrink-swell potential.	Severe: slow percolation rate; shrink-swell potential.	Severe: slopes greater than 10 percent.
(WvD3)	Poor	Poor	Severe: shrink-swell potential.	Severe: slow percolation rate; shrink-swell potential.	Severe: clayey surface layer.
Wilkes: (WwC)	Fair	Poor	Severe: depth to rock 1 to 10 feet; shrink-swell potential.	Severe: depth to rock 1 to 10 feet; shrink-swell potential.	Moderate: fair trafficability.
(WwE)	Fair	Poor	Severe: depth to rock 1 to 10 feet; shrink-swell potential.	Severe: depth to rock 1 to 10 feet; shrink-swell potential.	Severe: slopes greater than 10 percent.

interpretations—Continued

Degree of limitation for—Continued		Soil features affecting—			
Recreation—Continued		Highway location	Farm ponds		Sprinkler irrigation
Picnic areas	Intensive play areas		Reservoir area	Compacted embankment	
Slight	Moderate: slopes of 6 to 10 percent.	None	Moderate permeability.	Moderate to low strength and stability; nearly impervious.	Low available water capacity.
Severe: flooding; high water table.	Severe: flooding; high water table.	Flooding; high water table.	Slow permeability.	Moderately low strength and stability; nearly impervious.	Medium available water capacity.
Slight	Severe: rock	Rock	Moderately rapid permeability.	Moderate strength and stability; pervious.	Very low available water capacity.
Moderate: slopes of 10 to 25 percent.	Severe: slopes greater than 10 percent.	Rock	Moderately rapid permeability.	Moderate strength and stability; pervious.	Very low available water capacity.
Slight	Slight	Frost-susceptible material.	Moderate permeability.	Moderate strength and stability; nearly impervious.	Medium available water capacity.
Slight	Moderate: slopes of 6 to 10 percent.	Frost-susceptible material.	Moderate permeability.	Moderate strength and stability; nearly impervious.	Medium available water capacity.
Moderate: slopes of 10 to 15 percent.	Severe: slopes greater than 10 percent.	Frost-susceptible material.	Moderate permeability.	Moderate strength and stability; nearly impervious.	Medium available water capacity.
Moderate: slopes of 15 to 25 percent.	Severe: slopes greater than 15 percent.	Frost-susceptible material.	Moderate permeability.	Moderate strength and stability; nearly impervious.	Medium available water capacity.
Severe: flooding; high water table.	Severe: flooding; high water table.	High water table; flooding.	Moderate permeability.	Moderately low strength and stability: nearly impervious.	Medium available water capacity.
Moderate: fair trafficability.	Moderate: fair trafficability.	Highly plastic material.	Slow permeability.	Low strength and stability: impervious.	High available water capacity.
Moderate: fair trafficability.	Moderate: fair trafficability; slopes of 6 to 10 percent.	Highly plastic material.	Slow permeability.	Low strength and stability: impervious.	High available water capacity.
Moderate: fair trafficability; slopes greater than 10 percent.	Severe: slopes greater than 10 percent.	Highly plastic material.	Slow permeability.	Low strength and stability: impervious.	High available water capacity.
Severe: clayey surface layer.	Severe: clayey surface layer.	Highly plastic material.	Slow permeability.	Low strength and stability: impervious.	High available water capacity.
Moderate: fair trafficability.	Moderate: fair trafficability.	Rock	Moderate permeability.	Moderately low strength and stability: nearly impervious.	Low available water capacity.
Moderate: fair trafficability; slopes of 10 to 20 percent.	Severe: slopes greater than 10 percent.	Rock	Moderate permeability.	Moderately low strength and stability: nearly impervious.	Low available water capacity.

TABLE 6.—*Engineering*

Soil series and map symbols	Suitability as source of—		Degree of limitation for—		
	Topsoil	Road fill	Homebuilding sites	Septic tank absorption fields	Recreation: Campsites
Wilkes—Continued					
(WwF)	Fair	Poor	Severe: depth to rock 1 to 10 feet; shrink-swell potential.	Severe: depth to rock 1 to 10 feet; shrink-swell potential.	Severe: slopes greater than 20 percent.
(WxE)	Poor	Poor	Severe: stoniness; depth to rock 1 to 10 feet.	Severe: depth to rock 1 to 10 feet.	Severe: slopes greater than 15 percent.
Worsham (Wy)	Poor	Poor	Severe: flooding; high water table.	Severe: flooding; high water table.	Severe: flooding; high water table.

Reaction, or the degree of acidity or alkalinity, is given in terms of pH values.

Shrink-swell potential indicates the expected change in volume when the moisture content changes. It is estimated primarily on the basis of the amount and type of clay in a soil. In general, soils classified as CH and A–7 have high shrink-swell potential. Sandy soils have low shrink-swell potential.

Engineering interpretations

Table 6 gives interpretations of the properties that affect suitability of the soils for engineering. The ratings as a source of topsoil are based on thickness, texture, fertility, and available water capacity. For example, droughty sands are given a rating of poor, but loams are given a rating of fair to good, depending on the thickness of the soil material.

Suitability as a source of road fill is rated according to texture, shrinkage, plasticity, water content, and the degree of compactive effort required to obtain the desired density. The water content of the soil at the time of use may affect suitability for road fill. A clayey soil, for example, is difficult to handle when it is wet.

The degree of limitation for homebuilding sites is based on the hazard of flooding, the height of the water table, slope, shrink-swell potential, and depth to hard rock.

The degree of limitation for sewage disposal in septic tank absorption fields is rated according to permeability of the soil, its slope and filtering capability, the level of the water table, and the hazard of flooding. Much of Wake County is rural; therefore, septic tank absorption fields are required for the disposal of sewage. Generally, absorption fields installed in a poorly drained soil fail because the soil is not permeable enough to absorb the effluent. In wet weather and for long periods afterward, the soils are saturated and the water table is near the surface. At such times, there is no space for outflow from the septic tank and the movement of sewage effluent is very slow. Onsite investigation should be made before a septic tank absorption field is installed in any soil.

The degree of limitation for campsites is based on the hazards of flooding and wetness, and on trafficability and slope. Trafficability, as used here, refers to the ability of a soil to support vehicles or other traffic during normal weather. Campsites are considered as areas suitable for tents and activities that accompany outdoor living for periods of at least 1 week.

The degree of limitation for picnic areas is based on the hazards of flooding, wetness, and slope. Picnic areas are places suitable for pleasure outings, where picnic tables and fireplaces are usually furnished, and where meals can be prepared and eaten outdoors. Apart from these facilities, only a small amount of site preparation is needed.

The degree of limitation as areas for intensive play is based on the slope, depth to hard rock, wetness, soil texture, and the amount of coarse fragments in and on the soils. Areas for intensive play are developed for use as playgrounds and for playing organized games, as baseball, tennis, and badminton.

The suitability of the soils for highways is affected by such soil characteristics, as plasticity, high water table, water content, flooding, depth to hard rock, susceptibility to frost, and stability of slopes. Durham soils, for example, have no soil features that adversely affect their use as locations for highways. Their water table is low enough that it will not interefer with the construction of roads, the soil material has good bearing capacity and is not difficult to compact, and permeability is moderate. White Store soils, on the other hand, were rated as having features that adversely affect the location of highways. These soils are highly plastic, are slowly permeable, and have low bearing capacity (fig. 15).

interpretations—Continued

Degree of limitation for—Continued		Soil features affecting—			
Recreation—Continued		Highway location	Farm ponds		Sprinkler irrigation
Picnic areas	Intensive play areas		Reservoir area	Compacted embankment	
Severe: slopes greater than 20 percent.	Severe: slopes greater than 20 percent.	Rock	Moderate permeability.	Moderately low strength and stability; nearly impervious.	Low available water capacity.
Moderate: slopes of 15 to 25 percent.	Severe: slopes greater than 15 percent.	Rock	Moderate permeability.	Moderately low strength and stability; nearly impervious.	Low available water capacity.
Severe: flooding; high water table.	Severe: flooding; high water table.	High water table; flooding.	Moderately slow permeability.	Moderately low strength and stability; nearly impervious.	Medium available water capacity.

The suitability of the soils for farm ponds is affected principally by such characteristics as strength, stability, and permeability of the compacted soil material. Estimates of strength and stability are based on a standard slope of 2.5:1 for dams less than 50 feet high. Flatter side slopes make a more stable embankment. Permeability of an undisturbed soil is the best indicator of seepage. The permeability ratings used in table 6 range from slow for firm clays to rapid for sands. As used in table 6, *pervious*, *semipervious*, *nearly impervious*, and *impervious* refer to the relative permeability of compacted embankments. Water losses are excessive in pervious soils and are significant in semipervious soils. They are minor in nearly impervious soils and are almost negligible in impervious soils.

Rainfall in Wake County is generally adequate for agriculture but is not always well distributed during the growing season. Some of the soils hold little water available to plants, and sprinkler irrigation is beneficial at times. The main factors affecting suitability of the soils for irrigation are available water capacity, permeability, and rate of water intake. The Soil Conservation Service, in cooperation with the North Carolina Agricultural Experiment Station, Agricultural Research Service, and the Agricultural Extension Service, has prepared an "Irrigation Guide," which gives detailed information useful in the planning and design of sprinkler irrigation systems.

The soils are not rated in table 6 for suitability for terraces, but terraces and other erosion control practices are needed on the sloping soils that are cultivated. Terraces can be established on most soils in the county that have a slope of not more than 6 percent, except those that have a thick, sandy surface layer and those that are shallow over bedrock. Most soils need smoothing to make feasible the construction of parallel terraces, the use of four-row equipment, and the improvement of row drainage.

Adequate outlets are needed for safe disposal of surface runoff from terraces, diversions, and other drainageways. A cover of plants is needed in these drainageways. Grade-control structures, such as pipe drops, drop spillways, and sod chutes, as well as supporting agronomic practices, are needed in places to control erosion.

Formation and Classification of Soils

In this section the factors that have affected the formation and composition of soils in Wake County are discussed. In addition, the soils are classified according to the current system and are placed in their respective great soil groups according to the old system of classification.

Figure 15.—**Roadbank that has caved during a wet season. The soil is a White Store sandy loam.**

Formation of Soils

Soil is the product of the combined effects of parent material, climate, plant and animal life, relief, and time. The characteristics of a soil at any given place depend upon the combined effects of these five environmental factors at the particular place. All of these factors affect the formation of every soil. In many places, however, one or two factors are dominant and fix most of the properties of the soil.

Parent material

Parent material is the mass from which a soil is formed. It is the factor that is primarily responsible for the chemical and mineralogical composition of a soil, and it is one of the most important factors that has caused differences among the soils. Some major differences among soils, such as those in texture, are easily seen and can be determined in the field. Minor differences in mineralogical composition are determined only by careful laboratory analysis.

The parent material of the soils in Wake County ranges from Precambrian to Tertiary in age. It differs greatly from one part of the county to another in mineral and chemical composition. Nevertheless, the parent material of the soils in the county is of only three main kinds—(1) material that weathered from bedrock; (2) Coastal Plain sediment; and (3) alluvium. The following paragraphs discuss the soils in relation to these main kinds of parent material.

Material that weathered from bedrock.—Cecil, Appling, Durham, and Madison soils have formed in material that weathered from mica gneiss, mica schist, granite, and other acidic rocks that contain a large amount of quartz. These soils have a surface layer of sandy loam to loamy sand and a subsoil of red to yellow, clayey material. The Louisburg and Wake soils, which were derived from some of these same kinds of parent material, have a surface layer of loamy sand to sand and have a loamy subsoil or no subsoil. These soils occur throughout the county, except in the western part.

Lloyd and Enon soils have formed in material that weathered from granodiorite, hornblende gneiss, and other basic rocks, or from mixed acidic and basic rocks. They have a surface layer of loam to fine sandy loam and a dark-red to olive-yellow, clayey subsoil. Wilkes soils have the same kind of parent material as the Lloyd and Enon soils, and they have a surface layer of sandy loam to silt loam and a varicolored and varitextured subsoil. Wilkes soils occur primarily northwest and west of Raleigh.

Georgeville, Herndon, and other soils have formed in material that weathered from phyllite, one of the rocks included in the Carolina slates. They have a surface layer of silt loam and a red to strong-brown, clayey subsoil. These soils have a high content of silt throughout their profile. They occur primarily in the western part of the county, but smaller areas are east of Zebulon and in the southern part of the county.

The Mayodan, Granville, White Store, and Creedmoor soils have formed in material that weathered from the Newark group of sedimentary rocks of Triassic age. These rocks are primarily sandstone and shale, but they include lesser amounts of mudstone, claystone, siltstone, and conglomerate. The Mayodan, Granville, White Store, and Creedmoor soils have a surface layer of sandy loam to silt loam and a varicolored, clayey subsoil. The White Store and Creedmoor soils have a clay subsoil that is very firm when moist and plastic when wet, and they have a high content of aluminum. The Pinkston soils, which are derived from the same kind of parent material as the White Store and Creedmoor soils, have a surface layer of sandy loam and a subsoil of coarse loamy material, or they lack a subsoil. Pinkston soils occur in the western part of the county.

Coastal Plain sediment.—The soils that formed in Coastal Plain sediment, for example the Norfolk, Wagram, Faceville, Orangeburg, and Rains, have a surface layer of loamy sand to fine sandy loam and a subsoil of loamy to clayey material. Drainage of these soils ranges from somewhat excessive to poor. These soils occur in the southern part of the county.

Alluvium.—The soils that formed in general alluvium or in deposits of local alluvium are the Buncombe, Congaree, Chewacla, Wehadkee, Bibb, and Mantachie. These soils have a surface layer of sand to silt loam and a subsoil of sandy to fine loamy material. They occur along streams and in upland depressions and draws throughout the county, and they are somewhat excessively drained to poorly drained.

Climate

Climate affects the physical, chemical, and biological relationships of soils, primarily through the influence of precipitation and temperature. Water from rain and snow dissolves minerals, is necessary for biological activity, and transports minerals and organic residue through the soil profile. The amount of water that actually percolates through the soil over a broad area depends mainly on the amount and duration of rainfall, the relative humidity, the rate of evapotranspiration, and the length of the frost-free period. Temperature influences the kind and the growth of organisms and the speed of physical and chemical reactions in the soils.

Wake County has a warm, humid climate. The average annual temperature is 61° F., and the average annual daily minimum temperature is 51°. The average monthly temperature ranges from 42° in January to 79° in July. Precipitation is well distributed and averages 46.9 inches per year. The amount of annual precipitation, however, ranges from 50 inches, in the southern part of the county, to 43 inches in the northwestern part. The mild temperature and the abundant moisture cause rapid decomposition of organic matter and hasten chemical reactions in the soils. The large amount of rainfall leaches out a large part of the soluble bases and moves less soluble, fine material deeper in the soil.

The climate of the county varies only slightly from place to place, and the small differences that occur have probably not caused local differences in the soils. Nevertheless, the soils show the effects of climate in that they are acid and have a profile that is strongly leached in the upper part. Climate has also effected variations in the plant and animal life of the county. The most important effects that climate has had on the formation of

the soils is the alteration of parent material through changes in temperature, through changes in the amount of precipitation, and through influence on plant and animal life.

Plant and animal life

Plants and animals modify the formation of soils to some extent. The kinds and numbers of organisms in and on the soil are determined, to a large extent, by the climate and, to a varying degree, by the parent material, relief, and age of the soils. Bacteria, fungi, and other microscopic organisms aid in the weathering of rocks and in the decomposition of organic matter. The larger plants and animals furnish organic matter and transfer elements from the subsoil to the surface layer.

The activity of fungi and micro-organisms in the soils of Wake County usually takes place only in the uppermost few inches of the soil material. Earthworms and other small invertebrates carry on a slow, but continuous, cycle of soil mixing, also mostly in the uppermost few inches of soil material. Rodents have had little effect on the formation of soils in this county.

This county was originally covered by a forest consisting of many kinds of hardwoods and several kinds of conifers. These trees took up elements from the subsoil and added organic matter by depositing leaves, roots, twigs, and eventually the whole plant on the surface. Here, these plant remains decayed and were acted on by micro-organisms, earthworms, and other forms of life and by direct chemical reaction.

Organic matter decays rapidly in a well-drained soil, but excess moisture retards oxidation of organic matter. Therefore, decay is slow in wet soils. Generally, the wetter the soils the greater the accumulation of organic matter.

For the most part, plants and animals determine the kinds of organic matter added to the soil and the way in which the organic matter is incorporated in the soil. They transfer plant nutrients from one horizon to another, and often they transport soil material from one horizon to another. Plants and animals also affect the gains and losses in organic matter and the gains and losses of nitrogen and other plant nutrients. They also affect the soil structure and porosity of the soils and may also affect some other soil characteristics.

Relief

Relief is largely determined by the kinds of rock formations underlying the soils and by the geologic history of the area, including crustal movements, dissection by streams, and the development of the landscape through the retreat of slopes. Relief influences the formation of soils through its effect on moisture relationships, erosion, temperature, and the cover of plants. Its influence is modified by the other factors of soil formation.

In Wake County the slopes range from 0 to 45 percent. The soils of uplands, such as the Cecil, Mayodan, and Norfolk, have a thick, well-developed profile in areas where the slope is less than 10 percent. Where the slope is greater than 10 percent, geologic removal of soil material is more rapid. As a result, many of the steeper soils, for example the Wilkes, Pinkston, and Wake, have a thin, poorly defined profile.

Relief largely determines the natural drainage of a soil. As an example, several different soils, such as the Durham, which are well drained, the Colfax, which are somewhat poorly drained, and the Worsham, which are poorly drained, have formed in similar parent material but have different characteristics because of differences in drainage. The poorly drained soils have a dark-colored surface layer and are nearly level. Most soils that formed in alluvium also are nearly level.

Time

The length of time required for a soil profile to develop depends on the other factors of soil formation. Less time is required for profile development in a humid, warm area where the cover of plants is dense than in a dry, cold area where the cover of plants is sparse. Likewise, less time is required for a soil profile to develop in coarse-textured material than in similar, but finer textured material, even though the environment is the same for both.

Soils vary considerably in age. Old soils generally have more distinct horizons than young soils. In Wake County the old soils on the smoother parts of the uplands have well-defined horizons. The younger soils that have steep slopes as the result of geologic erosion are generally shallower over bedrock and have a less well developed profile than the older soils. Young soils, such as those that have formed in alluvium, have not been in place long enough for well-defined horizons to have developed.

Classification of Soils

Soils are classified so that we can more easily remember their significant characteristics. Classification enables us to assemble knowledge about the soils, to see their relationships to one another and to the whole environment, and to develop principles that help us to understand their behavior and their response to manipulation. First, through classification, and then through use of soil maps, we can apply our knowledge of soils to specific fields and other tracts of land.

Thus, in classification, soils are placed in narrow categories that are used in detailed soil surveys so that knowledge about the soils can be organized and applied in managing farms, fields, and woodlands; in developing rural areas; in performing engineering work; and in many other ways. They are placed in broad classes to facilitate study and comparison in large areas, such as countries and continents.

Two systems of classifying soils have been used in the United States in recent years. The older system was adopted in 1938 (*2*) and later revised (*13*). The system currently used was adopted for general use by the National Cooperative Soil Survey in 1965. The current system is under continual study. Therefore, readers interested in developments of the current system should search the latest literature available (*12*, *16*).

In table 7 the family, subgroup, and order of the current system are given for each soil series. Also given are the great soil groups under the older system. Some soils in this survey area do not fit any series recognized in the current classification, but placing them in a new series would not serve a useful purpose. Such soils are named

TABLE 7.—*Classification of the soils*

Soil series	Family	Subgroup	Order	Great soil group of the 1938 system
Altavista	Fine-loamy, mixed, thermic	Aquic Hapludults	Ultisols	Red-Yellow Podzolic soils.
Appling	Clayey, kaolinitic, thermic	Typic Hapludults	Ultisols	Red-Yellow Podzolic soils.
Augusta	Fine-loamy, mixed, thermic	Aeric Ochraquults	Ultisols	Red-Yellow Podzolic soils intergrading toward Low-Humic Gley soils.
Bibb	Coarse-loamy, siliceous, acid, thermic.	Typic Haplaquents	Entisols	Low-Humic Gley soils.
Buncombe	Mixed, thermic	Typic Udipsamments	Entisols	Alluvial soils.
Cecil	Clayey, kaolinitic, thermic	Typic Hapludults	Ultisols	Red-Yellow Podzolic soils.
Chewacla	Fine-loamy, mixed, thermic	Aquic Fluventic Dystrochrepts.	Inceptisols	Alluvial soils.
Colfax	Fine-loamy, mixed, mesic	Aquic Fragiudults	Ultisols	Red-Yellow Podzolic soils intergrading toward Low-Humic Gley soils.
Congaree [1]	Fine-loamy, mixed, nonacid, thermic.	Typic Udifluvents	Entisols	Alluvial soils.
Creedmoor	Clayey, mixed, thermic	Aquic Hapludults	Ultisols	Planosols.
Durham	Fine-loamy, siliceous, thermic	Typic Hapludults	Ultisols	Red-Yellow Podzolic soils.
Enon	Fine, mixed, thermic	Ultic Hapludalfs	Alfisols	Red-Yellow Podzolic soils intergrading toward Planosols.
Faceville	Clayey, kaolinitic, thermic	Typic Paleudults	Ultisols	Red-Yellow Podzolic soils.
Georgeville	Clayey, kaolinitic, thermic	Typic Hapludults	Ultisols	Red-Yellow Podzolic soils.
Goldsboro	Fine-loamy, siliceous, thermic	Aquic Paleudults	Ultisol-	Red-Yellow Podzolic soils.
Granville	Fine-loamy, siliceous, thermic	Typic Hapludults	Ultisols	Red-Yellow Podzolic soils.
Helena	Clayey, mixed, thermic	Aquic Hapludults	Ultisols	Planosols.
Herndon	Clayey, kaolinitic, thermic	Typic Hapludults	Ultisols	Red-Yellow Podzolic soils.
Lloyd	Clayey, kaolinitic, thermic	Typic Hapludults	Ultisols	Red-Yellow Podzolic soils.
Louisburg	Coarse-loamy, mixed, thermic	Ruptic-Ultic Dystrochrepts	Inceptisols	Lithosols.
Lynchburg	Fine-loamy, siliceous, thermic	Aeric Ochraquults	Ultisols	Red-Yellow Podzolic soils intergrading toward Low-Humic Gley soils.
Madison	Clayey, kaolinitic, thermic	Typic Hapludults	Ultisols	Red-Yellow Podzolic soils.
Mantachie [1]	Fine-loamy, siliceous, acid, thermic.	Aeric Fluventic Haplaquepts.	Inceptisols	Alluvial soils intergrading toward Low-Humic Gley soils.
Mayodan	Clayey, kaolinitic, thermic	Typic Hapludults	Ultisols	Red-Yellow Podzolic soils.
Norfolk	Fine-loamy, siliceous, thermic	Typic Paleudults	Ultisols	Red-Yellow Podzolic soils.
Orangeburg	Fine-loamy, siliceous, thermic	Typic Paleudults	Ultisols	Red-Yellow Podzolic soils.
Pinkston	Coarse-loamy, mixed, thermic	Ruptic-Ultic Dystrochrepts.	Inceptisols	Lithosols.
Plummer	Loamy, siliceous, thermic	Grossarenic Ochraquults	Ultisols	Low-Humic Gley soils.
Rains	Fine-loamy, siliceous, thermic	Typic Ochraquults	Ultisols	Low-Humic Gley soils.
Roanoke	Clayey, mixed, thermic	Typic Ochraquults	Ultisols	Low-Humic Gley soils.
Troup	Loamy, siliceous, thermic	Grossarenic Paleudults	Ultisols	Regosols.
Vance	Clayey, mixed, thermic	Typic Hapludults	Ultisols	Red-Yellow Podzolic soils.
Wagram	Loamy, siliceous, thermic	Arenic Paleudults	Ultisols	Red-Yellow Podzolic soils.
Wahee [1]	Clayey, kaolinitic, thermic	Aeric Ochraquults	Ultisols	Planosols.
Wake	Siliceous, thermic	Lithic Udipsamments	Entisols	Lithosols.
Wedowee	Clayey, kaolinitic, thermic	Typic Hapludults	Ultisols	Red-Yellow Podzolic soils.
Wehadkee [1]	Fine-loamy, mixed, nonacid, thermic.	Fluventic Haplaquepts	Inceptisols	Alluvial soils intergrading toward Low-Humic Gley soils.
White Store	Clayey, mixed, thermic	Vertic Hapludults	Ultisols	Planosols.
Wilkes	Loamy, mixed, thermic, shallow	Typic Hapludalfs	Alfisols	Lithosols.
Worsham	Clayey, mixed, thermic	Typic Ochraquults	Ultisols	Low-Humic Gley soils.

[1] These soils are taxadjuncts to the respective series. They are enough like the series that a new series is not warranted.

for the series they strongly resemble, because they differ from that series in ways too small to be of consequence in interpreting their usefulness or behavior. Soil scientists designate such soils as taxadjuncts to the series for which they are named.

In this survey, soils named as members of the Congaree, Mantachie, Wahee, and Wehadkee series are taxadjuncts to those series. Soils of this survey area that were placed in the Congaree series are more acid than typical for that series; those in the Mantachie series are less clayey and are nonacid; those in the Wahee series have a subsoil that is slightly brighter colored; and those included with the Wehadkee series are more acid.

Additional Facts About the County

This section gives general facts about Wake County. It describes physiography, relief, drainage, water supply, and climate. It also discusses briefly the history and de-

velopment and gives facts about commerce and industry in the county. Facts about the water supply and about physiography, relief, and drainage were taken largely from a manuscript on file at the North Carolina Department of Water Resources.[8]

Physiography, Relief, and Drainage

Wake County is part of an uplifted peneplain, dissected in places by a network of streams that generally flow in a southeasterly direction. The part of the county in the Coastal Plain province has relief typical both of that in the Piedmont physiographic province and that of the Coastal Plain. Because of this overlapping of physiographic characteristics, the area is considered to be a transitional zone between the Piedmont uplands and the Coastal Plain and is often referred to as the fall zone or fall line.

Throughout the county, erosion has altered the original relief. Most areas are gently rolling, but the areas between streams are broad and flat. No hills stand out prominently above the general land surface. The areas in which relief is most broken are near large streams, where the differences in elevation range from 50 to 100 feet from the highest to the lowest points.

Differences in elevation are more pronounced in the western part of the county than in the southeastern part. The highest point in the county, about 540 feet above sea level, is a quarter of a mile north of Leesville. The lowest point, about 160 feet above sea level, is a half mile southeast of Shotwell, where Marks Creek flows into Johnston County. Raleigh, in the central part of the county, is about 350 feet above sea level.

In most places a thick layer of soil material and of soft, weathered rock overlies the bedrock. In some parts of the county, where road cuts are deep, this soft, weathered material is exposed to depths greater than 20 feet. Stone lines that are apparent at various depths in many places indicate that repeated cutting and filling occurred until the present landscape, mainly of broad ridges and of smooth, gentle side slopes, became fairly stable.

The Neuse River and its tributaries drain about 80 percent of the county, but the southwestern part is drained by tributaries of the Cape Fear River. The Neuse River and many of its larger tributaries are antecedent streams that flow in a southeasterly direction. The direction of flow of the smaller streams is primarily controlled by the regional structure and resistance to erosion of the underlying rocks.

Because of differences in relief, the natural surface drainage is generally medium to rapid. It is slow, however, on some nearly level interstream divides and on the flood plains of streams. In the part of the county called the Triassic Basin, the valleys are U-shaped and the flood plains are fairly wide. This basin is a swampy depression or lake where the rock and mineral deposits were made during the Triassic period. In other parts of the county, the valleys are V-shaped and the flood plains are generally narrow.

[8] NORTH CAROLINA DEPARTMENT OF WATER RESOURCES. GEOLOGY AND GROUND-WATER RESOURCES IN THE RALEIGH AREA, NORTH CAROLINA. [Open file manuscript], 179 pp., illus. 1966.

Water Supply

Water for domestic and industrial uses is obtained from wells and from surface sources in Wake County. The ground water is suitable for most uses. All of the rocks in the county, except those of Triassic age, are good aquifers. Springs are rarely used as a source of water, because their yield is small and generally the springs are inaccessible.

Drilled wells are the most common type in this county, but there are a number of bored wells and a few that are dug. Wells that penetrate granite or metamorphic rocks generally yield an adequate amount of water for domestic use. A yield of 10 to 15 gallons per minute can be obtained from wells that penetrate the saprolite that overlies granite, or it can be obtained from the unconsolidated Coastal Plain sediment. The yield from soils that overlie rocks of Triassic age generally is only 3 to 5 gallons per minute. Where a larger yield is required, wells should be located in areas where the potential sources of ground water appear to be the most favorable. Visible features that indicate a favorable source of ground water are fracture zones, quartz veins, deeply weathered areas, intruded dikes, and draws, depressions, or other low spots in the landscape. The best yielding wells in rocks of Triassic age are located near diabase dikes.

The largest number of wells in this county is on the broad upland flats. Many wells are on the tops of hills, however, some are on the side slopes, and a few are in draws. The average depth of these wells is 157 feet. The yield ranges from 0 to 295 gallons per minute, but the average yield is 17 gallons per minute. The diameter of drilled wells used as a source of water for domestic use is 3 to 8 inches; that of drilled wells used to supply industrial and municipal needs is 6 to 20 inches.

In rural areas wells are the source of practically all of the water needed for domestic use. Water for municipalities comes both from wells and from surface sources. Raleigh, Wake Forest, and Apex obtain water from stream-fed, manmade lakes; Zebulon obtains about one-fourth of its supply of water from four wells, and the rest from Privetts Pond on the Little River; and Cary obtains part of its supply from 14 wells and part from the city of Raleigh. Other municipalities in the county obtain all their supply of water from wells.

Climate[9]

Wake County has a moderate climate. The weather is rarely extremely rigorous, though constantly changing weather patterns that affect the area bring a variety of weather that is changeable both by seasons and within seasons. The climate is determined, to some extent, by the latitude. Also, the county is located near the central part of North Carolina. It is about halfway between the Appalachian Mountains, on the northwest, and the Atlantic Ocean, on the southeast, and it is protected from climatic extremes, to some degree, both by the mountains and the ocean. In winter the mountains serve as an effective barrier to the cold fronts that frequently move down across the Central Plains from Canada. The moun-

[9] By A. V. HARDY, State climatologist of North Carolina.

tains turn aside some weak cold fronts so that these fronts never reach the county. The stronger cold fronts are modified, to some extent, as they cross the mountains.

When winds blow from directions ranging from northeast or east to southwest, the effects of the Atlantic Ocean, the Gulf of Mexico, and the inland bodies of water that occupy much of the eastern part of North Carolina are most strongly felt. The temperature of these bodies of water changes much less rapidly with changes in the seasons than does that of masses of land. Seasonal variations in the temperature of land areas crossed by air that has passed over these bodies of water tend to be minimized. Also, the air picks up a significant amount of moisture as it passes over the water, and it releases this moisture in the form of rain or snow when it passes over the land.

Lesser influences, for example, relief, cause variations in climate within the county, even within short distances. The county is mostly gently rolling. It is mainly between 300 and 500 feet above sea level, though some areas are higher than 500 feet and some are lower than 200 feet. These differences in relief and in elevation cause some differences in temperature.

Records of temperature and precipitation have been kept at several places within the county, and all have been considered in preparing this study of the climate. The longest period of record is that maintained since 1887 to the present time by the U.S. Weather Bureau in or near the city of Raleigh. The most complete record in rural areas is that at the Weather Bureau Airport Station at Raleigh-Durham Airport. That record was begun in 1944 and has been kept continuously since that time.

Table 8 gives facts about temperature and precipitation in Wake County. When that table was prepared, consideration was given to all available data for this county. Where feasible, the data were adapted so that they would be representative of temperature and precipitation in rural areas in the central part of the county, as well as of those in other parts.

TEMPERATURE.—The first columns of table 8 indicate both the average temperatures and the average variability of temperature in Wake County. The highest temperature ever officially recorded within the county occurred on 2 different days in July 1952, when a temperature of 105° F. was reached. The lowest temperature of record is 2° below zero, which occurred in February 1899. Only once since 1899 has the temperature reached zero or below. During warm spells during any month in winter, the temperature occasionally reaches as high as 80°, and during cold snaps in summer, the temperature sometimes drops as low as the forties. Rarely, however, does a temperature as high as 80° occur in winter or a temperature as low as the forties occur in summer.

Figure 16 shows the probabilities that a specified temperature will occur on or before the specified date in spring or before the specified date in fall. Local differences in temperature, especially in minimum temperature, can be caused by differences in relief and by the presence of cities or community developments.

In calm, clear weather, heat is radiated from open, unsheltered earth surfaces at night; the surfaces cool rapidly and, in turn, cool the layer of air in contact with them. Air, thus cooled, is heavier than warm air. It flows downhill to the lowest spots and accumulates in any closed basin in the area. Continued radiation and air drainage during a clear night can produce a differ-

TABLE 8.—*Temperature and precipitation for Wake County, N.C.*

[Elevation, 400 feet]

Month	Temperature				Precipitation					Soil temperature at 4-inch depth [1]
	Average daily maximum	Average daily minimum	Two years in 10 will have at least 4 days with—		Average total	One year in 10 will have—		Days with snow cover	Average depth of snow on days with snow cover	
			Maximum temperature equal to or higher than—	Minimum temperature equal to or lower than—		Less than—	More than—			
	°F.	°F.	°F.	°F.	*Inches*	*Inches*	*Inches*	*Number*	*Inches*	°F.
January	51	33	69	15	3.3	1.6	6.6	3	2	40
February	53	34	72	19	3.5	1.2	5.4	2	1	42
March	61	41	76	24	3.7	1.6	6.0	1	3	48
April	71	49	86	33	3.8	1.8	5.4	0	0	59
May	79	58	91	43	3.8	1.2	6.3	0	0	67
June	86	66	97	54	3.9	1.8	8.0	0	0	76
July	88	69	97	61	5.9	2.6	10.0	0	0	79
August	87	68	96	59	5.4	1.4	9.7	0	0	79
September	82	63	91	47	4.6	1.3	6.4	0	0	73
October	72	52	86	34	2.8	.5	6.2	0	0	63
November	61	42	77	26	3.0	1.1	7.0	(2)	(3)	52
December	52	34	67	15	3.2	1.7	6.1	1	1	43
Year	70	51	[4] 99	[5] 12	46.9	36.1	55.0	7	2	60

[1] An average of 4 daily observations made at 6-hour intervals.
[2] Less than one-half day.
[3] Less than one-half inch.
[4] Average annual highest temperature.
[5] Average annual lowest temperature.

ence of several degrees in minimum temperatures within a short distance. As a result, frost and freezing temperatures can occur in one area while the temperature in a nearby area is above freezing. When dense clouds cover an area, or when winds blow continuously throughout the night, no pockets of cold air form, and temperatures remain fairly uniform throughout the county.

PRECIPITATION.—The amount of precipitation decreases gradually from the southeastern part of the county to the northwest. The average amount recorded for any given location depends, to a great extent, on the length of the period of years of record. The average amount recorded for a given period, even for a period as long as 25 to 30 years, can vary noticeably from the average for an earlier or a later period of similar length. Comparisons of figures for precipitation for a recent 10-year period, when the period during which records were kept was the same for all stations, indicate that the average precipitation is about 50 inches or more per year in the southeastern part of Wake County, about 47 inches in the central part, and only about 43 inches along the northwestern edge of the county at the Raleigh-Durham Airport. These figures agree fairly well with those for older periods in which amounts of precipitation were recorded for the same general areas. No recent observations are available for the extreme southern and the extreme northern parts of the county.

In spite of these minor variations, precipitation is generally plentiful and is well distributed throughout the year. Distribution during a particular rain, however, can vary a great deal. The amount of rain received in a storm in summer, generally in a thundershower, is especially likely to vary greatly within a short distance. Individual thunderclouds are sometimes effective in only a small area, and they sometimes cause copious rain in one part of the county while another part has less rain or no rain. Sometimes an area is repeatedly missed by such small-scale summer rains, and it thus becomes dry enough that supplemental irrigation is necessary for crops to grow well. Rains in winter are usually the result of large, moving, low-pressure storms. The amount of moisture these storms bring is likely to be more nearly uniform throughout the county than that received in a storm in summer.

Thunderstorms in summer occasionally bring rain heavy enough that it causes damage. In a given area of the county, rain amounting to as much as 2 inches in a single hour is to be expected on an average of about once in 5 years; rain amounting to 4 inches or more in an hour is to be expected only about once in 50 years. In some areas of the county, heavy rain may occur almost every summer, but the area affected is generally small.

Data for snow, given in table 8, were mostly derived from records kept during recent years at the Raleigh-Durham Airport, but averages for the entire county were also considered. Though snow may fall at any time during the period from November through March, it is most likely to accumulate and remain on the ground in January and February. A few of the heaviest snows have fallen early in March, but these storms occur rarely and the snow generally melts quickly. Earlier records, not used in accumulating data for table 8, indicate that a heavy snow once fell in April.

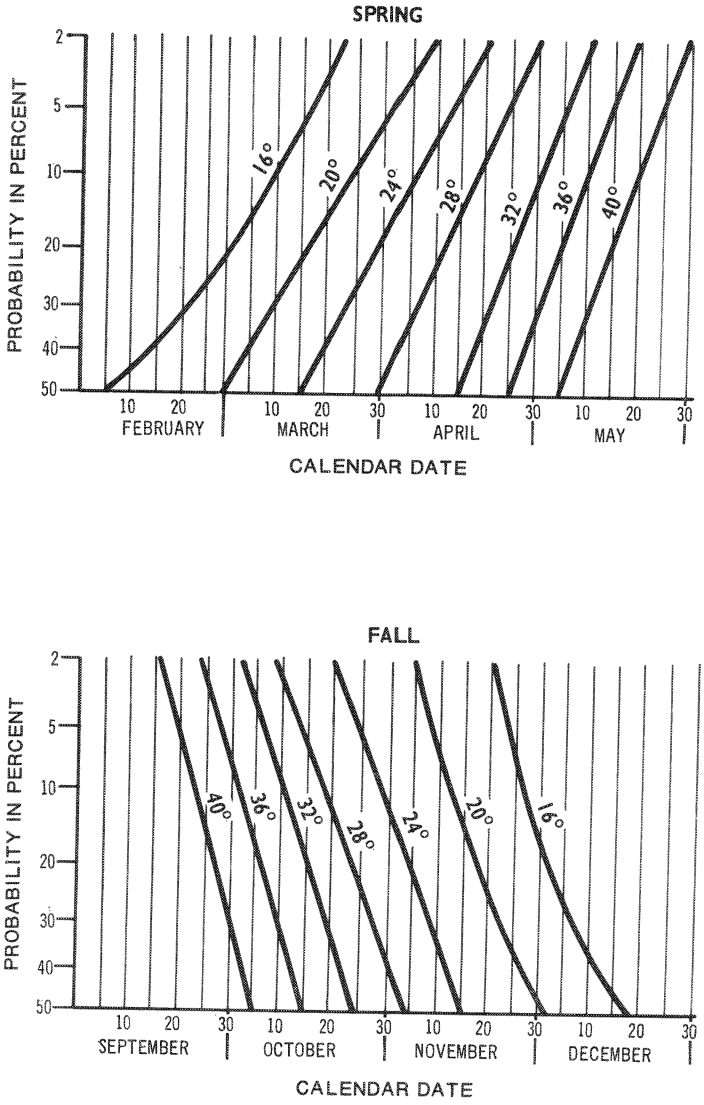

***Figure 16.*—Probability that the temperature in an open, level area in Wake County will be 16°, 20°, 24°, 28°, 32°, 36°, or 40° F. after the dates indicated in spring and before the dates indicated in fall.**

STORMS.—Summer thunderstorms are sometimes accompanied by hail, damaging winds, or both. Hail or windstorms usually affect only a small area, however, and a given area is not likely to be damaged by these storms more than once in many years. Once in a great many years, a small tornado accompanies a thunderstorm, and serious damage is inflicted in a small area. The likelihood is negligible, however, that any given place will be affected by such a storm. At times in most summers, the velocity of the wind is strong enough that the limbs of trees are broken and antennas or signboards are damaged. Also, hail that noticeably punctures tobacco leaves falls at times. The areas affected by these windstorms or hailstorms are generally small.

Sleetstorms or glaze, winter cold fronts, and tropical hurricanes are other storms that sometimes affect the weather of Wake County. Sleet sometimes accumulates on the ground like snow. Glaze results when rain falls

in freezing weather and forms a layer of ice that accumulates on the surface where it falls. Periods of glaze, sometimes called ice storms, occur less frequently in this county than in the western and extreme northern parts of the Piedmont, but they occasionally cause breakage of trees, shrubs, and communication lines. Usually, winter cold fronts must cross the mountains to reach this area. Therefore, they lose much of the force with which they pass over the Great Plains. Tropical hurricanes rarely cause serious damage this far inland. They sometimes cause an increase in precipitation and bring winds of moderate force.

OTHER FACTORS THAT AFFECT CLIMATE.—Other factors besides temperature, precipitation, and storms affect climate. Among these are wind, sunshine, and humidity. The prevailing direction of the wind in this county is from the southwest, but the wind blows from the northeast almost as much as from the southwest. It blows from the northeast, especially in autumn. The average velocity of the wind near the earth's surface is 8 miles per hour. The average velocity is higher in early afternoon and is lower between midnight and dawn than at other times.

The sun shines more than half the total number of daylight hours. The time during which the sun shines ranges from half the possible time in winter to two-thirds or more of the possible time late in spring and early summer.

The average relative humidity is about 70 percent year round. The average daily variation ranges from about 50 percent in midafternoon to 85 to 90 percent at sunrise. The relative humidity varies slightly according to the season. The average humidity is lowest in spring and highest late in summer.

History and Development

The first settlers to arrive in what is now Wake County came from Halifax about 1741. In 1760 one of these settlers built his home in the area that is now the city of Raleigh. The county was formed in 1771 from parts of Johnston, Cumberland, and Orange Counties and was named for the Wake family.

The early settlers grew corn, wheat, oats, tobacco, and some cotton on the uplands and used the grassy areas along streams for grazing cattle and hogs. Because only crude implements were available for cultivation and most of the work was done by hand, returns from farming were small. Most farmers owned a mill for grinding corn and wheat, and a distillery for processing surplus grain and fruit. They also produced turpentine and tar, but those products were of only minor economic importance.

At first, the settlers did little trading outside of their own area, but later they began to take flour, pork, and tobacco to New Bern to trade for commodities that they could not produce. Still later, after the Cape Fear River came into use for navigation, Fayetteville became the market for the eastern, southern, and western parts of the county. Petersburg, Va., was the preferred market for farmers in the northern part of the county, and large numbers of cattle were driven there.

The development of Wake County and of the city of Raleigh were closely associated. After the country became independent, North Carolina's General Assemblies met in many different places, but they had no place to store their State records. When they met in 1778, it was resolved that a permanent site be selected for a State capital. A tract of 1,000 acres was selected for the State capital and was purchased at a price of $2,756. The city was planned and was laid out while it was still in forest and farmland, and it was named Raleigh for the English adventurer, Sir Walter Raleigh.

The history of the county is closely linked to the development of the railroads. Between 1856 and 1870, the towns of Cary, Garner, Morrisville, Apex, Zebulon, and Fuquay Springs sprang up along the railroad rights-of-way, and those communities are still active. The development of the towns of Holly Springs, Wake Forest, Wendell, and Knightdale was also influenced by the growth of the railroads.

As late as 1879, cotton was the most important crop. Corn and small grains were grown on large acreages, however, and only small acreages were used to grow sweetpotatoes, hay, and tobacco. Ten years later, the acreages of cotton, corn, and wheat had decreased considerably and the acreages of tobacco, oats, rye, sweetpotatoes, and hay had increased (*9*). This marked the beginning of a trend that has continued into the present decade. Cotton is now of only minor importance. Tobacco contributes a major part of the gross farm income.

Cattle, poultry, and hogs are raised extensively; income from sales of livestock and livestock products accounted for more than a fifth of the gross farm income in 1964. Over the past several decades, industry, commerce, and research have increased steadily in their contribution to the economic life of the county.

Commerce and Industry

Government and education are extremely important to the economic life of Wake County. Government at all levels employs a great number of people.

Since 1953, manufacturing has grown a great deal. Many people are employed in electronics, in metal fabrication, and in the manufacture of machinery, apparel, textiles, food items, chemicals, and a number of other products.

The Research Triangle concept, built around Duke University in Durham, the University of North Carolina at Chapel Hill, and North Carolina State University at Raleigh, has been one of the great spurs to the industrialization of this area. This concept led to the establishment of a 5,000-acre industrial park to be used for research and research-oriented industries. The Research Triangle Park has attracted leading research firms, and these firms, in turn, have attracted leading manufacturers to the area.

Wake County is also a distributing and wholesaling center. Food distributors, who serve the eastern parts of the Carolinas, are among the most important of these distributors and wholesalers. Numerous retail stores, insurance companies, utility companies, and others not only serve the communities but also provide employment for many people.

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Glossary

Acidity, soil. See Reaction, soil.

Alluvium. Soil material, such as sand, silt, or clay, that has been deposited on land by streams.

Available water capacity. The capacity of a soil to hold water in a form available to plants. The amount of moisture held in a soil between field capacity, or about one-third atmosphere of tension, and the wilting point, or about 15 atmospheres of tension. Commonly expressed as inches of water per inch of soil.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose. Noncoherent; the soil does not hold together in a mass.

Friable. When moist, the soil crushes under gentle to moderate pressure between thumb and forefinger and can be pressed together into a lump.

Firm. When moist, the soil crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic. When wet, the soil is readily deformed by moderate pressure but can be pressed into a lump; forms a wire when rolled between thumb and forefinger.

Sticky. When wet, the soil adheres to other material, and tends to stretch somewhat and pull apart, rather than to pull free from other material.

Hard. When dry, the soil is moderately resistant to pressure and is difficult to break between the thumb and forefinger.

Soft. When dry, the soil breaks into powder or individual grains under very slight pressure.

Cemented. Hard and brittle; little affected by moistening.

Creep, soil. The downward movement of masses of soil material, primarily through the action of gravity. The movement is generally slow and irregular. It occurs most commonly when the lower part of the soil is nearly saturated with water, and it may be facilitated by alternate freezing and thawing.

Drainage, natural. Refers to moisture conditions that existed during the development of the soil, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but can be caused by the sudden deepening of channels or the blocking of a drainage outlet. The following seven different classes of natural drainage are recognized:

Excessively drained soils are commonly very porous, are rapidly permeable, and have low water-holding capacity.

Somewhat excessively drained soils are also very permeable and are free from mottling throughout their profile.

Well-drained soils are nearly free from mottling and are commonly of intermediate texture.

Moderately well drained soils commonly have a slowly permeable layer in or immediately beneath the solum. They have uniform color in the A and upper B horizons and have mottling in the lower B and C horizons.

Somewhat poorly drained soils are wet for significant periods but not all the time.

Poorly drained soils are wet for long periods, are light gray, and generally are mottled from the surface downward, though mottling may be absent or nearly absent in some soils.

Very poorly drained soils are wet nearly all the time. They have a dark-gray or black surface layer and are gray, light gray, or without mottling in the deeper parts of the profile.

Erosion. The wearing away of the land surface by wind, running water, and other geologic agents.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Flood plain. Nearly level land, consisting of stream sediment, that borders a stream and is subject to flooding unless protected artificially.

Horizon, soil. A layer of soil, approximately parallel to the surface, that has distinct characteristics produced by soil-forming processes and that differs in one or more ways from adjacent horizons in the same profile. These are the major soil horizons:

O horizon. The layer of organic matter on the surface of a mineral soil. This layer consists of decaying plant residue.

A horizon. The mineral horizon at the surface or just below an O horizon. This horizon is the one in which living organisms are most active, and it is therefore marked by the accumulation of humus. The horizon may have lost one or more of soluble salts, clay, and sesquioxides (iron and aluminum oxides).

B horizon. The mineral horizon below an A horizon. The B horizon is in part a layer of change from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics caused by accumulation of clay, sesquioxides, humus, or some combination of these; by prismatic or blocky structure; by redder or stronger colors; or by some combination of these characteristics. The combined A and B horizons are usually called the solum, or true soil. If a soil lacks a B horizon, the A horizon alone is the solum.

C *horizon.* The weathered rock material immediately beneath the solum. This layer, commonly called the soil parent material, is presumed to be like that from which the overlying horizons were formed in most soils. If the underlying material is known to be different from that in the solum, a Roman numeral precedes the letter C.

R layer. Consolidated rock beneath the soil. The rock generally underlies a C horizon but may be immediately beneath an A or B horizon.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Mottled. Irregularly marked with spots of different colors that vary in number and size. Mottling in soils usually indicates poor aeration and lack of drainage. Descriptive terms are as follows: Abundance—*few, common,* and *many;* size—*fine, medium,* and *coarse;* and contrast—*faint, distinct,* and *prominent.* The size measurements are these: *Fine,* less than 5 millimeters (about 0.2 inch) in diameter along the greatest dimension; *medium,* ranging from 5 to 15 millimeters (about 0.2 to 0.6 inch) in diameter along the greatest dimension; and *coarse,* more than 15 millimeters (about 0.6 inch) in diameter along the greatest dimension.

Ped. An individual natural soil aggregate, such as a crumb, a prism, or a block, in contrast to a clod.

Permeability, soil. The quality of a soil horizon that enables water or air to move through it. Terms used to describe permeability are as follows: *Very slow, slow, moderately slow, moderate, moderately rapid, rapid,* and *very rapid.*

Plinthite. The sesquioxide-rich, humus-poor, highly weathered mixture of clay with quartz and other diluents that commonly shows as red mottles, usually in platy, polygonal, or reticulate patterns. Plinthite changes irreversibly to hardpan or to irregular aggregates upon repeated wetting and drying, or is the hardened relict of the soft, red mottles. It is a form of laterite.

Reaction, soil. The degree of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is precisely neutral in reaction because it is neither acid nor alkaline. An acid soil is one that gives an acid reaction; an alkaline soil is one that is alkaline in reaction. In words, the degrees of acidity or alkalinity are expressed thus:

	pH		*pH*
Extremely acid	Below 4.5	Neutral	6.6 to 7.3
Very strongly acid	4.5 to 5.0	Mildly alkaline	7.4 to 7.8
Strongly acid	5.1 to 5.5	Moderately alkaline	7.9 to 8.4
Medium acid	5.6 to 6.0	Strongly alkaline	8.5 to 9.0
Slightly acid	6.1 to 6.5	Very strongly alkaline	9.1 and higher

Sand. As a soil separate, individual rock or mineral fragments ranging from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz, but sand may be of any mineral composition. As a textural class, soil that is 85 percent or more sand and not more than 10 percent clay.

Sesquioxides. Oxides having trivalent cations, as iron or aluminum oxides.

Silt. As a soil separate, individual mineral particles that range from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Soil. A natural, three-dimensional body on the earth's surface that supports plants and that has properties resulting from the integrated effect of climate and living matter acting upon parent material, as conditioned by relief over periods of time.

Structure, soil. The arrangement of primary soil particles into compound particles or clusters that are separated from adjoining aggregates and have properties unlike those of an equal mass of unaggregated primary soil particles. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular. Structureless* soils are (1) *single grain* (each grain by itself, as in dune sand) or (2) *massive* (the particles adhering together without any regular cleavage, as in many claypans and hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the profile below plow depth.

Substratum. Any layer lying beneath the solum, or true soil.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea. Stream terraces are frequently called second bottoms, as contrasted with flood plains, and are seldom subject to overflow. Marine terraces were deposited by the sea and are generally wide.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay.* The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Tilth, soil. The condition of the soil in relation to the growth of plants, especially soil structure. Good tilth refers to the friable state, and is associated with high noncapillary porosity and stable, granular structure. A soil in poor tilth is nonfriable, hard, nonaggregated, and difficult to till.

GUIDE TO MAPPING UNITS

For a full description of a mapping unit, read both the description of the mapping unit and the soil series to which it belongs. Other information is given in tables as follows:

Acreage and extent, table 1, p. 7.
Estimated yields, table 2, p. 74.

Engineering uses of the soils, tables 4, 5, 6, pp. 88 through 109.

Map symbol	Mapping unit	Described on page	Capability unit		Woodland suitability group		Wildlife suitability group	
			Symbol	Page	Number	Page	Number	Page
AfA	Altavista fine sandy loam, 0 to 4 percent slopes-	9	IIw-1	67	4	79	1	85
AgB	Appling gravelly sandy loam, 2 to 6 percent slopes----------	9	IIe-1	66	5	79	1	85
AgB2	Appling gravelly sandy loam, 2 to 6 percent slopes, eroded----------	10	IIe-1	66	5	79	1	85
AgC	Appling gravelly sandy loam, 6 to 10 percent slopes----------	10	IIIe-1	67	5	79	1	85
AgC2	Appling gravelly sandy loam, 6 to 10 percent slopes, eroded----------	10	IIIe-1	67	5	79	1	85
ApB	Appling sandy loam, 2 to 6 percent slopes--------	10	IIe-1	66	5	79	1	85
ApB2	Appling sandy loam, 2 to 6 percent slopes, eroded----------	11	IIe-1	66	5	79	1	85
ApC	Appling sandy loam, 6 to 10 percent slopes-------	11	IIIe-1	67	5	79	1	85
ApC2	Appling sandy loam, 6 to 10 percent slopes, eroded----------	11	IIIe-1	67	5	79	1	85
ApD	Appling sandy loam, 10 to 15 percent slopes------	12	IVe-1	71	5	79	1	85
AsB	Appling fine sandy loam, 2 to 6 percent slopes---	12	IIe-1	66	5	79	1	85
AsB2	Appling fine sandy loam, 2 to 6 percent slopes, eroded----------	12	IIe-1	66	5	79	1	85
AsC	Appling fine sandy loam, 6 to 10 percent slopes--	12	IIIe-1	67	5	79	1	85
AsC2	Appling fine sandy loam, 6 to 10 percent slopes, eroded----------	13	IIIe-1	67	5	79	1	85
Au	Augusta fine sandy loam----------	13	IIIw-2	70	4	79	2	85
(1/)	Borrow area----------	14	(1/)	--	13	83	5	87
Bu	Buncombe soils----------	14	IVs-1	72	3	79	4	87
CeB	Cecil sandy loam, 2 to 6 percent slopes----------	15	IIe-1	66	5	79	1	85
CeB2	Cecil sandy loam, 2 to 6 percent slopes, eroded--	15	IIe-1	66	5	79	1	85
CeC	Cecil sandy loam, 6 to 10 percent slopes---------	16	IIIe-1	67	5	79	1	85
CeC2	Cecil sandy loam, 6 to 10 percent slopes, eroded-	16	IIIe-1	67	5	79	1	85
CeD	Cecil sandy loam, 10 to 15 percent slopes---------	16	IVe-1	71	5	79	1	85
CeF	Cecil sandy loam, 15 to 45 percent slopes--------	16	VIe-1	72	5	79	1	85
CgB	Cecil gravelly sandy loam, 2 to 6 percent slopes-	16	IIe-1	66	5	79	1	85
CgB2	Cecil gravelly sandy loam, 2 to 6 percent slopes, eroded----------	17	IIe-1	66	5	79	1	85
CgC	Cecil gravelly sandy loam, 6 to 10 percent slopes----------	17	IIIe-1	67	5	79	1	85
CgC2	Cecil gravelly sandy loam, 6 to 10 percent slopes, eroded----------	17	IIIe-1	67	5	79	1	85
ClB3	Cecil clay loam, 2 to 6 percent slopes, severely eroded----------	17	IIIe-2	68	5	79	1	85
ClC3	Cecil clay loam, 6 to 10 percent slopes, severely eroded----------	17	IVe-2	71	5	79	1	85
ClE3	Cecil clay loam, 10 to 20 percent slopes, severely eroded----------	18	VIe-2	73	5	79	1	85
Cm	Chewacla soils----------	18	IIIw-1	70	1	78	2	85
Cn	Colfax sandy loam----------	19	IIIw-2	70	4	79	2	85
Co	Congaree fine sandy loam----------	20	IIw-2	67	1	78	2	85
Cp	Congaree silt loam----------	20	IIw-2	67	1	78	2	85
CrB	Creedmoor sandy loam, 2 to 6 percent slopes------	21	IIe-3	66	11	82	1	85
CrB2	Creedmoor sandy loam, 2 to 6 percent slopes, eroded----------	21	IIIe-3	69	11	82	1	85
CrC	Creedmoor sandy loam, 6 to 10 percent slopes-----	22	IIIe-3	69	11	82	1	85

GUIDE TO MAPPING UNITS--Continued

Map symbol	Mapping unit	Described on page	Capability unit		Woodland suitability group		Wildlife suitability group	
			Symbol	Page	Number	Page	Number	Page
CrC2	Creedmoor sandy loam, 6 to 10 percent slopes, eroded	22	IVe-3	71	11	82	1	85
CrE	Creedmoor sandy loam, 10 to 20 percent slopes	22	VIe-1	72	11	82	1	85
CtB	Creedmoor silt loam, 2 to 6 percent slopes	22	IIe-3	66	11	82	1	85
CtC	Creedmoor silt loam, 6 to 10 percent slopes	23	IIIe-3	69	11	82	1	85
DuB	Durham loamy sand, 2 to 6 percent slopes	23	IIe-1	66	5	79	1	85
DuB2	Durham loamy sand, 2 to 6 percent slopes, eroded	23	IIe-1	66	5	79	1	85
DuC	Durham loamy sand, 6 to 10 percent slopes	24	IIIe-1	67	5	79	1	85
DuC2	Durham loamy sand, 6 to 10 percent slopes, eroded	24	IIIe-1	67	5	79	1	85
EnB	Enon fine sandy loam, 2 to 6 percent slopes	25	IIe-3	66	11	82	1	85
EnB2	Enon fine sandy loam, 2 to 6 percent slopes, eroded	25	IIe-3	66	11	82	1	85
EnC	Enon fine sandy loam, 6 to 10 percent slopes	25	IIIe-3	69	11	82	1	85
EnC2	Enon fine sandy loam, 6 to 10 percent slopes, eroded	25	IIIe-3	69	11	82	1	85
EnD2	Enon fine sandy loam, 10 to 15 percent slopes, eroded	26	IVe-3	71	11	82	1	85
FaB	Faceville sandy loam, 2 to 6 percent slopes	26	IIe-1	66	6	80	1	85
FaB2	Faceville sandy loam, 2 to 6 percent slopes, eroded	27	IIe-1	66	6	80	1	85
FaC2	Faceville sandy loam, 6 to 10 percent slopes, eroded	27	IIIe-1	67	6	80	1	85
GeB	Georgeville silt loam, 2 to 6 percent slopes	28	IIe-2	66	5	79	1	85
GeB2	Georgeville silt loam, 2 to 6 percent slopes, eroded	28	IIe-2	66	5	79	1	85
GeC	Georgeville silt loam, 6 to 10 percent slopes	28	IIIe-2	68	5	79	1	85
GeC2	Georgeville silt loam, 6 to 10 percent slopes, eroded	28	IIIe-2	68	5	79	1	85
GeD2	Georgeville silt loam, 10 to 15 percent slopes, eroded	29	IVe-2	71	5	79	1	85
Go	Goldsboro sandy loam	29	IIw-1	67	4	79	1	85
GrB	Granville sandy loam, 2 to 6 percent slopes	30	IIe-1	66	5	79	1	85
GrB2	Granville sandy loam, 2 to 6 percent slopes, eroded	30	IIe-1	66	5	79	1	85
GrC	Granville sandy loam, 6 to 10 percent slopes	31	IIIe-1	67	5	79	1	85
GrC2	Granville sandy loam, 6 to 10 percent slopes, eroded	32	IIIe-1	67	5	79	1	85
GrD	Granville sandy loam, 10 to 15 percent slopes	32	IVe-1	71	5	79	1	85
Gu	Gullied land	32	VIIe-1	73	13	83	15	87
HeB	Helena sandy loam, 2 to 6 percent slopes	33	IIe-3	66	11	82	1	85
HeB2	Helena sandy loam, 2 to 6 percent slopes, eroded	33	IIIe-3	69	11	82	1	85
HeC	Helena sandy loam, 6 to 10 percent slopes	33	IIIe-3	69	11	82	1	85
HeC2	Helena sandy loam, 6 to 10 percent slopes, eroded	33	IVe-3	71	11	82	1	85
HeD	Helena sandy loam, 10 to 15 percent slopes	34	IVe-3	71	11	82	1	85
HrB	Herndon silt loam, 2 to 6 percent slopes	34	IIe-2	66	5	79	1	85
HrB2	Herndon silt loam, 2 to 6 percent slopes, eroded	35	IIe-2	66	5	79	1	85
HrC	Herndon silt loam, 6 to 10 percent slopes	35	IIIe-2	68	5	79	1	85
HrC2	Herndon silt loam, 6 to 10 percent slopes, eroded	35	IIIe-2	68	5	79	1	85
HrD2	Herndon silt loam, 10 to 15 percent slopes, eroded	35	IVe-2	71	5	79	1	85
HrE	Herndon silt loam, 15 to 25 percent slopes	36	VIe-1	72	5	79	1	85
LdB2	Lloyd loam, 2 to 6 percent slopes, eroded	36	IIe-2	66	5	79	1	85
LdC2	Lloyd loam, 6 to 10 percent slopes, eroded	36	IIIe-2	68	5	79	1	85
LdD2	Lloyd loam, 10 to 15 percent slopes, eroded	37	IVe-2	71	5	79	1	85
LoB	Louisburg loamy sand, 2 to 6 percent slopes	37	IIIe-4	69	12	82	4	87
LoC	Louisburg loamy sand, 6 to 10 percent slopes	38	IVe-3	71	12	82	4	87

GUIDE TO MAPPING UNITS--Continued

Map symbol	Mapping unit	Described on page	Capability unit		Woodland suitability group		Wildlife suitability group	
			Symbol	Page	Number	Page	Number	Page
LoD	Louisburg loamy sand, 10 to 15 percent slopes----	38	VIe-1	72	12	82	4	87
LwB	Louisburg-Wedowee complex, 2 to 6 percent slopes-	38	IIIe-4	69	12	82	4	87
LwB2	Louisburg-Wedowee complex, 2 to 6 percent slopes, eroded----------	38	IIIe-4	69	12	82	4	87
LwC	Louisburg-Wedowee complex, 6 to 10 percent slopes----------	38	IVe-3	71	12	82	4	87
LwC2	Louisburg-Wedowee complex, 6 to 10 percent slopes, eroded----------	39	IVe-3	71	12	82	4	87
Ly	Lynchburg sandy loam----------	40	IIw-1	67	4	79	2	85
Ma	Made land----------	40	(1/)	--	13	83	5	87
MdB2	Madison sandy loam, 2 to 6 percent slopes, eroded----------	40	IIe-1	66	5	79	1	85
MdC2	Madison sandy loam, 6 to 10 percent slopes, eroded----------	41	IIIe-1	67	5	79	1	85
MdD2	Madison sandy loam, 10 to 15 percent slopes, eroded----------	41	IVe-1	71	5	79	1	85
MdE2	Madison sandy loam, 15 to 25 percent slopes, eroded----------	41	VIe-1	72	5	79	1	85
Me	Mantachie soils----------	42	IIIw-2	70	4	79	2	85
MfB	Mayodan sandy loam, 2 to 6 percent slopes--------	43	IIe-1	66	5	79	1	85
MfB2	Mayodan sandy loam, 2 to 6 percent slopes, eroded----------	43	IIe-1	66	5	79	1	85
MfC	Mayodan sandy loam, 6 to 10 percent slopes-------	43	IIIe-1	67	5	79	1	85
MfC2	Mayodan sandy loam, 6 to 10 percent slopes, eroded----------	44	IIIe-1	67	5	79	1	85
MfD2	Mayodan sandy loam, 10 to 15 percent slopes, eroded----------	44	IVe-1	71	5	79	1	85
MfE	Mayodan sandy loam, 15 to 25 percent slopes------	44	VIe-1	72	5	79	1	85
MgB	Mayodan gravelly sandy loam, 2 to 6 percent slopes----------	44	IIe-1	66	5	79	1	85
MgB2	Mayodan gravelly sandy loam, 2 to 6 percent slopes, eroded----------	44	IIe-1	66	5	79	1	85
MgC	Mayodan gravelly sandy loam, 6 to 10 percent slopes----------	45	IIIe-1	67	5	79	1	85
MgC2	Mayodan gravelly sandy loam, 6 to 10 percent slopes, eroded----------	45	IIIe-1	67	5	79	1	85
MyB	Mayodan silt loam, thin, 2 to 6 percent slopes---	45	IIe-2	66	5	79	1	85
MyB2	Mayodan silt loam, thin, 2 to 6 percent slopes, eroded----------	45	IIe-2	66	5	79	1	85
MyC	Mayodan silt loam, thin, 6 to 10 percent slopes--	46	IIIe-2	68	5	79	1	85
MyC2	Mayodan silt loam, thin, 6 to 10 percent slopes, eroded----------	46	IIIe-2	68	5	79	1	85
MyD	Mayodan silt loam, thin, 10 to 15 percent slopes--	46	IVe-2	71	5	79	1	85
NoA	Norfolk loamy sand, 0 to 2 percent slopes--------	47	I-1	65	6	80	1	85
NoB	Norfolk loamy sand, 2 to 6 percent slopes--------	47	IIe-1	66	6	80	1	85
NoB2	Norfolk loamy sand, 2 to 6 percent slopes, eroded----------	47	IIe-1	66	6	80	1	85
NoC	Norfolk loamy sand, 6 to 10 percent slopes-------	48	IIIe-1	67	6	80	1	85
NoC2	Norfolk loamy sand, 6 to 10 percent slopes, eroded----------	48	IIIe-1	67	6	80	1	85
OrB	Orangeburg loamy sand, 2 to 6 percent slopes-----	49	IIe-1	66	6	80	1	85
OrB2	Orangeburg loamy sand, 2 to 6 percent slopes, eroded----------	49	IIe-1	66	6	80	1	85
OrC2	Orangeburg loamy sand, 6 to 10 percent slopes, eroded----------	49	IIIe-1	67	6	80	1	85
PkC	Pinkston sandy loam, 0 to 10 percent slopes------	50	IVe-3	71	12	82	4	87

GUIDE TO MAPPING UNITS--Continued

Map symbol	Mapping unit	Described on page	Capability unit		Woodland suitability group		Wildlife suitability group	
			Symbol	Page	Number	Page	Number	Page
PkF	Pinkston sandy loam, 10 to 45 percent slopes-----	50	VIIe-1	73	12	82	4	87
Ps	Plummer sand----------	51	IVw-1	72	8	80	3	87
Ra	Rains fine sandy loam----------	51	IIIw-3	70	7	80	3	87
Ro	Roanoke fine sandy loam----------	52	IVw-1	72	2	78	3	87
Sw	Swamp----------	52	VIIw-1	73	14	84	3	87
VaB	Vance sandy loam, 2 to 6 percent slopes----------	54	IIe-3	66	11	82	1	85
VaB2	Vance sandy loam, 2 to 6 percent slopes, eroded--	54	IIe-3	66	11	82	1	85
VaC2	Vance sandy loam, 6 to 10 percent slopes, eroded-	54	IIIe-3	69	11	82	1	85
WaA	Wagram loamy sand, 0 to 2 percent slopes---------	55	IIs-1	67	9	81	4	87
WaB	Wagram loamy sand, 2 to 6 percent slopes---------	55	IIs-1	67	9	81	4	87
WaC	Wagram loamy sand, 6 to 10 percent slopes--------	56	IIIe-5	69	9	81	4	87
WgA	Wagram-Troup sands, 0 to 4 percent slopes--------	56	IIIs-1	70	10	81	4	87
Wh	Wahee fine sandy loam----------	56	IIIw-2	70	4	79	2	85
WkC	Wake soils, 2 to 10 percent slopes----------	57	IVe-3	71	12	82	4	87
WkE	Wake soils, 10 to 25 percent slopes----------	57	VIIe-1	73	12	82	4	87
WmB	Wedowee sandy loam, 2 to 6 percent slopes--------	58	IIe-1	66	5	79	1	85
WmB2	Wedowee sandy loam, 2 to 6 percent slopes, eroded----------	58	IIe-1	66	5	79	1	85
WmC	Wedowee sandy loam, 6 to 10 percent slopes-------	58	IIIe-1	67	5	79	1	85
WmC2	Wedowee sandy loam, 6 to 10 percent slopes, eroded----------	58	IIIe-1	67	5	79	1	85
WmD2	Wedowee sandy loam, 10 to 15 percent slopes, eroded----------	59	IVe-1	71	5	79	1	85
WmE	Wedowee sandy loam, 15 to 25 percent slopes------	59	VIe-1	72	5	79	1	85
Wn	Wehadkee silt loam----------	60	IVw-1	72	2	78	3	87
Wo	Wehadkee and Bibb soils----------	60	IVw-1	72	2	78	3	87
WsB	White Store sandy loam, 2 to 6 percent slopes----	61	IIe-3	66	11	82	1	85
WsB2	White Store sandy loam, 2 to 6 percent slopes, eroded----------	61	IIIe-3	69	11	82	1	85
WsC	White Store sandy loam, 6 to 10 percent slopes---	61	IIIe-3	69	11	82	1	85
WsC2	White Store sandy loam, 6 to 10 percent slopes, eroded----------	61	IVe-3	71	11	82	1	85
WsE	White Store sandy loam, 10 to 20 percent slopes--	62	VIe-1	72	11	82	1	85
WtB	White Store silt loam, 2 to 6 percent slopes-----	62	IIe-3	66	11	82	1	85
WvD3	White Store clay loam, 2 to 15 percent slopes, severely eroded----------	63	VIe-2	73	11	82	1	85
WwC	Wilkes soils, 2 to 10 percent slopes----------	63	IVe-3	71	12	82	4	87
WwE	Wilkes soils, 10 to 20 percent slopes----------	63	VIe-2	73	12	82	4	87
WwF	Wilkes soils, 20 to 45 percent slopes----------	64	VIIe-1	73	12	82	4	87
WxE	Wilkes stony soils, 15 to 25 percent slopes-------	64	VIIe-1	73	12	82	4	87
Wy	Worsham sandy loam----------	64	IVw-1	72	2	78	3	87

1/ Identified by its name on the soil map; not assigned to a capability unit.

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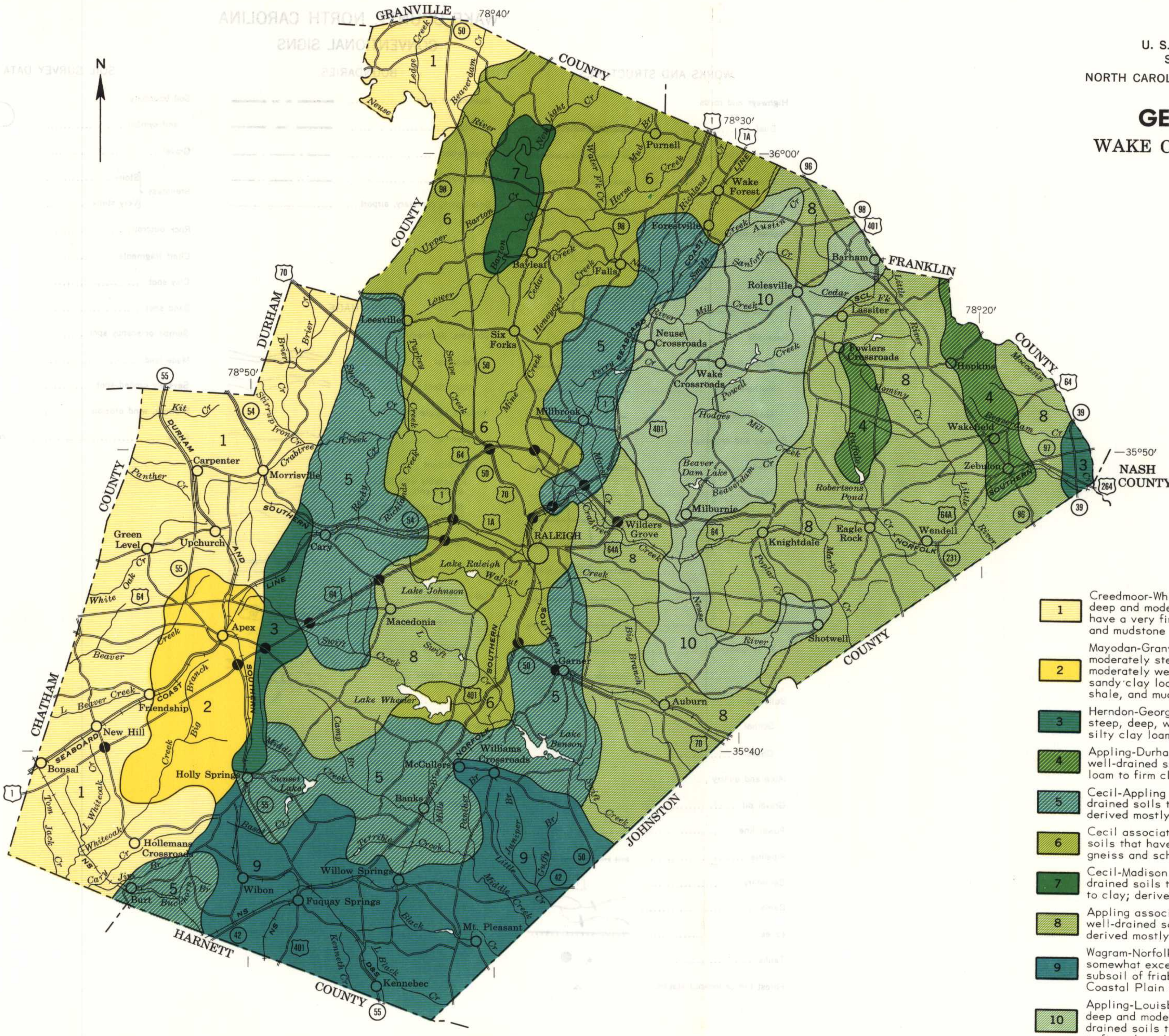
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NORTH CAROLINA AGRICULTURAL EXPERIMENT STATION

GENERAL SOIL MAP

WAKE COUNTY, NORTH CAROLINA

Scale 1:253 440

1 0 1 2 3 4 Miles



SOIL ASSOCIATIONS

1 — Creedmoor-White Store association: Gently sloping to hilly, deep and moderately deep, moderately well drained soils that have a very firm clayey subsoil; derived from sandstone, shale, and mudstone

2 — Mayodan-Granville-Creedmoor association: Gently sloping to moderately steep, deep or moderately deep, well-drained and moderately well drained soils that have a subsoil of friable sandy clay loam to very firm clay; derived from sandstone, shale, and mudstone

3 — Herndon-Georgeville association: Gently sloping to moderately steep, deep, well-drained soils that have a subsoil of friable silty clay loam to clay; derived from phyllite (Carolina slates)

4 — Appling-Durham association: Gently sloping to sloping, deep, well-drained soils that have a subsoil of friable sandy clay loam to firm clay; derived mostly from granite, gneiss, and schist

5 — Cecil-Appling association: Gently sloping to steep, deep, well-drained soils that have a subsoil of firm clay loam to clay; derived mostly from granite, gneiss, and schist

6 — Cecil association: Gently sloping to steep, deep, well-drained soils that have a subsoil of firm red clay; derived mostly from gneiss and schist

7 — Cecil-Madison association: Gently sloping to steep, deep, well-drained soils that have a subsoil of red, friable to firm clay loam to clay; derived mostly from gneiss and schist

8 — Appling association: Gently sloping to moderately steep, deep, well-drained soils that have a subsoil of firm clay loam to clay; derived mostly from granite, gneiss, and schist

9 — Wagram-Norfolk association: Nearly level to sloping, very deep, somewhat excessively drained and well-drained soils that have a subsoil of friable sandy loam to sandy clay loam; formed in Coastal Plain sediments

10 — Appling-Louisburg-Wedowee association: Gently sloping to steep, deep and moderately deep, well-drained and somewhat excessively drained soils that have a subsoil of very friable coarse sandy loam to firm clay; derived mostly from granite, gneiss, and schist

May 1969

INDEX TO MAP SHEETS

WAKE COUNTY, NORTH CAROLINA

Scale 1:253 440

1 0 1 2 3 4 Miles

N

GRANVILLE COUNTY

78°40′

78°30′

78°20′

78°50′

—36°00′

—35°50′

—35°40′

Inset, sheet 7

Inset, sheet 24

Inset, sheet 16

Inset, sheet 17

Inset, sheet 25

Inset, sheet 64

Inset, sheet 63

Inset, sheet 72

Inset, sheet 80

Inset, sheet 94

Inset, sheet 100

Inset, sheet 101

Inset, sheet 104

Inset, sheet 95

DURHAM COUNTY

FRANKLIN COUNTY

NASH COUNTY

CHATHAM COUNTY

HARNETT COUNTY

JOHNSTON COUNTY

Purnell

Wake Forest

Forestville

Barham

Rolesville

Lassiter

Bayleaf

Falls

Leesville

Six Forks

Neuse Crossroads

Wake Crossroads

Fowlers Crossroads

Hopkins

Wakefield

Zebulon

Millbrook

Carpenter

Morrisville

Milburnie

Wilders Grove

RALEIGH

Knightdale

Eagle Rock

Wendell

Green Level

Upchurch

Cary

Lake Raleigh

Lake Johnson

Macedonia

Apex

Garner

Shotwell

Auburn

Friendship

New Hill

Williams Crossroads

McCullers

Bonsal

Holly Springs

Banks

Hollemans Crossroads

Willow Springs

Wilson

Fuquay Springs

Burt

Mt. Pleasant

Kennebec

Lake Wheeler

Lake Benson

Robertsons Pond

Beaver Dam Lake

SEABOARD

SOUTHERN

NORFOLK

COAST

LINE

SOIL LEGEND

The first capital letter is the initial one of the soil name. A second capital letter, A, B, C, D, E, or F, shows the slope. Most symbols without a slope letter are those of nearly level soils or land types, but some are for land types that have a considerable range of slope. The number, 2 or 3, in a symbol shows that the soil is eroded or severely eroded.

SYMBOL	NAME
AfA	Altavista fine sandy loam, 0 to 4 percent slopes
AgB	Appling gravelly sandy loam, 2 to 6 percent slopes
AgB2	Appling gravelly sandy loam, 2 to 6 percent slopes, eroded
AgC	Appling gravelly sandy loam, 6 to 10 percent slopes
AgC2	Appling gravelly sandy loam, 6 to 10 percent slopes, eroded
ApB	Appling sandy loam, 2 to 6 percent slopes
ApB2	Appling sandy loam, 2 to 6 percent slopes, eroded
ApC	Appling sandy loam, 6 to 10 percent slopes
ApC2	Appling sandy loam, 6 to 10 percent slopes, eroded
ApD	Appling sandy loam, 10 to 15 percent slopes
AsB	Appling fine sandy loam, 2 to 6 percent slopes
AsB2	Appling fine sandy loam, 2 to 6 percent slopes, eroded
AsC	Appling fine sandy loam, 6 to 10 percent slopes
AsC2	Appling fine sandy loam, 6 to 10 percent slopes, eroded
Au	Augusta fine sandy loam
Bu	Buncombe soils
CeB	Cecil sandy loam, 2 to 6 percent slopes
CeB2	Cecil sandy loam, 2 to 6 percent slopes, eroded
CeC	Cecil sandy loam, 6 to 10 percent slopes
CeC2	Cecil sandy loam, 6 to 10 percent slopes, eroded
CeD	Cecil sandy loam, 10 to 15 percent slopes
CeF	Cecil sandy loam, 15 to 45 percent slopes
CgB	Cecil gravelly sandy loam, 2 to 6 percent slopes
CgB2	Cecil gravelly sandy loam, 2 to 6 percent slopes, eroded
CgC	Cecil gravelly sandy loam, 6 to 10 percent slopes
CgC2	Cecil gravelly sandy loam, 6 to 10 percent slopes, eroded
ClB3	Cecil clay loam, 2 to 6 percent slopes, severely eroded
ClC3	Cecil clay loam, 6 to 10 percent slopes, severely eroded
ClE3	Cecil clay loam, 10 to 20 percent slopes, severely eroded
Cm	Chewacla soils
Cn	Colfax sandy loam
Co	Congaree fine sandy loam
Cp	Congaree silt loam
CrB	Creedmoor sandy loam, 2 to 6 percent slopes
CrB2	Creedmoor sandy loam, 2 to 6 percent slopes, eroded
CrC	Creedmoor sandy loam, 6 to 10 percent slopes
CrC2	Creedmoor sandy loam, 6 to 10 percent slopes, eroded
CrE	Creedmoor sandy loam, 10 to 20 percent slopes
CtB	Creedmoor silt loam, 2 to 6 percent slopes
CtC	Creedmoor silt loam, 6 to 10 percent slopes
DuB	Durham loamy sand, 2 to 6 percent slopes
DuB2	Durham loamy sand, 2 to 6 percent slopes, eroded
DuC	Durham loamy sand, 6 to 10 percent slopes
DuC2	Durham loamy sand, 6 to 10 percent slopes, eroded
EnB	Enon fine sandy loam, 2 to 6 percent slopes
EnB2	Enon fine sandy loam, 2 to 6 percent slopes, eroded
EnC	Enon fine sandy loam, 6 to 10 percent slopes
EnC2	Enon fine sandy loam, 6 to 10 percent slopes, eroded
EnD2	Enon fine sandy loam, 10 to 15 percent slopes, eroded
FaB	Faceville sandy loam, 2 to 6 percent slopes
FaB2	Faceville sandy loam, 2 to 6 percent slopes, eroded
FaC2	Faceville sandy loam, 6 to 10 percent slopes, eroded

SYMBOL	NAME
GeB	Georgeville silt loam, 2 to 6 percent slopes
GeB2	Georgeville silt loam, 2 to 6 percent slopes, eroded
GeC	Georgeville silt loam, 6 to 10 percent slopes
GeC2	Georgeville silt loam, 6 to 10 percent slopes, eroded
GeD2	Georgeville silt loam, 10 to 15 percent slopes, eroded
Go	Goldsboro sandy loam
GrB	Granville sandy loam, 2 to 6 percent slopes
GrB2	Granville sandy loam, 2 to 6 percent slopes, eroded
GrC	Granville sandy loam, 6 to 10 percent slopes
GrC2	Granville sandy loam, 6 to 10 percent slopes, eroded
GrD	Granville sandy loam, 10 to 15 percent slopes
Gu	Gullied land
HeB	Helena sandy loam, 2 to 6 percent slopes
HeB2	Helena sandy loam, 2 to 6 percent slopes, eroded
HeC	Helena sandy loam, 6 to 10 percent slopes
HeC2	Helena sandy loam, 6 to 10 percent slopes, eroded
HeD	Helena sandy loam, 10 to 15 percent slopes
HrB	Herndon silt loam, 2 to 6 percent slopes
HrB2	Herndon silt loam, 2 to 6 percent slopes, eroded
HrC	Herndon silt loam, 6 to 10 percent slopes
HrC2	Herndon silt loam, 6 to 10 percent slopes, eroded
HrD2	Herndon silt loam, 10 to 15 percent slopes, eroded
HrE	Herndon silt loam, 15 to 25 percent slopes
LdB2	Lloyd loam, 2 to 6 percent slopes, eroded
LdC2	Lloyd loam, 6 to 10 percent slopes, eroded
LdD2	Lloyd loam, 10 to 15 percent slopes, eroded
LoB	Louisburg loamy sand, 2 to 6 percent slopes
LoC	Louisburg loamy sand, 6 to 10 percent slopes
LoD	Louisburg loamy sand, 10 to 15 percent slopes
LwB	Louisburg–Wedowee complex, 2 to 6 percent slopes
LwB2	Louisburg–Wedowee complex, 2 to 6 percent slopes, eroded
LwC	Louisburg–Wedowee complex, 6 to 10 percent slopes
LwC2	Louisburg–Wedowee complex, 6 to 10 percent slopes, eroded
Ly	Lynchburg sandy loam
Ma	Made land
MdB2	Madison sandy loam, 2 to 6 percent slopes, eroded
MdC2	Madison sandy loam, 6 to 10 percent slopes, eroded
MdD2	Madison sandy loam, 10 to 15 percent slopes, eroded
MdE2	Madison sandy loam, 15 to 25 percent slopes, eroded
Me	Mantachie soils
MfB	Mayodan sandy loam, 2 to 6 percent slopes
MfB2	Mayodan sandy loam, 2 to 6 percent slopes, eroded
MfC	Mayodan sandy loam, 6 to 10 percent slopes
MfC2	Mayodan sandy loam, 6 to 10 percent slopes, eroded
MfD2	Mayodan sandy loam, 10 to 15 percent slopes, eroded
MfE	Mayodan sandy loam, 15 to 25 percent slopes
MgB	Mayodan gravelly sandy loam, 2 to 6 percent slopes
MgB2	Mayodan gravelly sandy loam, 2 to 6 percent slopes, eroded
MgC	Mayodan gravelly sandy loam, 6 to 10 percent slopes
MgC2	Mayodan gravelly sandy loam, 6 to 10 percent slopes, eroded
MyB	Mayodan silt loam, thin, 2 to 6 percent slopes
MyB2	Mayodan silt loam, thin, 2 to 6 percent slopes, eroded
MyC	Mayodan silt loam, thin, 6 to 10 percent slopes
MyC2	Mayodan silt loam, thin, 6 to 10 percent slopes, eroded
MyD	Mayodan silt loam, thin, 10 to 15 percent slopes

SYMBOL	NAME
NoA	Norfolk loamy sand, 0 to 2 percent slopes
NoB	Norfolk loamy sand, 2 to 6 percent slopes
NoB2	Norfolk loamy sand, 2 to 6 percent slopes, eroded
NoC	Norfolk loamy sand, 6 to 10 percent slopes
NoC2	Norfolk loamy sand, 6 to 10 percent slopes, eroded
OrB	Orangeburg loamy sand, 2 to 6 percent slopes
OrB2	Orangeburg loamy sand, 2 to 6 percent slopes, eroded
OrC2	Orangeburg loamy sand, 6 to 10 percent slopes, eroded
PkC	Pinkston sandy loam, 0 to 10 percent slopes
PkF	Pinkston sandy loam, 10 to 45 percent slopes
Ps	Plummer sand
Ra	Rains fine sandy loam
Ro	Roanoke fine sandy loam
Sw	Swamp
VaB	Vance sandy loam, 2 to 6 percent slopes
VaB2	Vance sandy loam, 2 to 6 percent slopes, eroded
VaC2	Vance sandy loam, 6 to 10 percent slopes, eroded
WaA	Wagram loamy sand, 0 to 2 percent slopes
WaB	Wagram loamy sand, 2 to 6 percent slopes
WaC	Wagram loamy sand, 6 to 10 percent slopes
WgA	Wagram–Troup sands, 0 to 4 percent slopes
Wh	Wahee fine sandy loam
WkC	Wake soils, 2 to 10 percent slopes
WkE	Wake soils, 10 to 25 percent slopes
WmB	Wedowee sandy loam, 2 to 6 percent slopes
WmB2	Wedowee sandy loam, 2 to 6 percent slopes, eroded
WmC	Wedowee sandy loam, 6 to 10 percent slopes
WmC2	Wedowee sandy loam, 6 to 10 percent slopes, eroded
WmD2	Wedowee sandy loam, 10 to 15 percent slopes, eroded
WmE	Wedowee sandy loam, 15 to 25 percent slopes
Wn	Wehadkee silt loam
Wo	Wehadkee and Bibb soils
WsB	White Store sandy loam, 2 to 6 percent slopes
WsB2	White Store sandy loam, 2 to 6 percent slopes, eroded
WsC	White Store sandy loam, 6 to 10 percent slopes
WsC2	White Store sandy loam, 6 to 10 percent slopes, eroded
WsE	White Store sandy loam, 10 to 20 percent slopes
WtB	White Store silt loam, 2 to 6 percent slopes
WvD3	White Store clay loam, 2 to 15 percent slopes, severely eroded
WwC	Wilkes soils, 2 to 10 percent slopes
WwE	Wilkes soils, 10 to 20 percent slopes
WwF	Wilkes soils, 20 to 45 percent slopes
WxE	Wilkes stony soils, 15 to 25 percent slopes
Wy	Worsham sandy loam

Soil map constructed 1967 by Cartographic Division, Soil Conservation Service, USDA, from 1965 aerial photographs. Controlled mosaic based on North Carolina plane coordinate system, Lambert conformal conic projection, 1927 North American datum.

WAKE COUNTY, NORTH CAROLINA

CONVENTIONAL SIGNS

WORKS AND STRUCTURES

Highways and roads

- Dual
- Good motor
- Poor motor
- Trail

Highway markers

- National Interstate
- U. S.
- State or county

Railroads

- Single track
- Multiple track
- Abandoned

Bridges and crossings

- Road
- Trail
- Railroad
- Ferry (FY)
- Ford (FORD)
- Grade
- R. R. over
- R. R. under

- Tunnel
- Buildings
- School
- Church
- Mine and quarry
- Gravel pit
- Power line
- Pipeline
- Cemetery
- Dams
- Levee
- Tanks
- Forest fire or lookout station

BOUNDARIES

- National or state
- County
- Reservation
- Land grant
- Small park, cemetery, airport

DRAINAGE

Streams, double-line

- Perennial
- Intermittent

Streams, single-line

- Perennial

Intermittent

- Crossable with tillage implements
- Not crossable with tillage implements
- Unclassified

- Canals and ditches (CANAL)

Lakes and ponds

- Perennial (water, w)
- Intermittent
- Falls and rapids
- Spring
- Marsh or swamp
- Wet spot
- Alluvial fan
- Drainage end

RELIEF

Escarpments

- Bedrock
- Other

SOIL SURVEY DATA

- Soil boundary and symbol (Dx)
- Gravel
- Stoniness: Stony, Very stony
- Rock outcrops
- Chert fragments
- Clay spot
- Sand spot
- Gumbo or scabby spot
- Made land
- Severely eroded spot
- Blowout, wind erosion
- Gully

(Joins sheet 2)

(Joins sheet 4)

1

N

1 Mile 5000 Feet

Scale 1:15840

1 ¼ ½ ¾ 1

0 1000 2000 3000 4000 5000

N

1 Mile
5000 Feet

Scale 1:15840
1 0 5000
¾ 4000
½ 3000
¼ 2000
0 1000
0

N

1 Mile
5000 Feet

Scale 1:15840

(4)

N

1 Mile 5000 Feet

Scale 1:15840

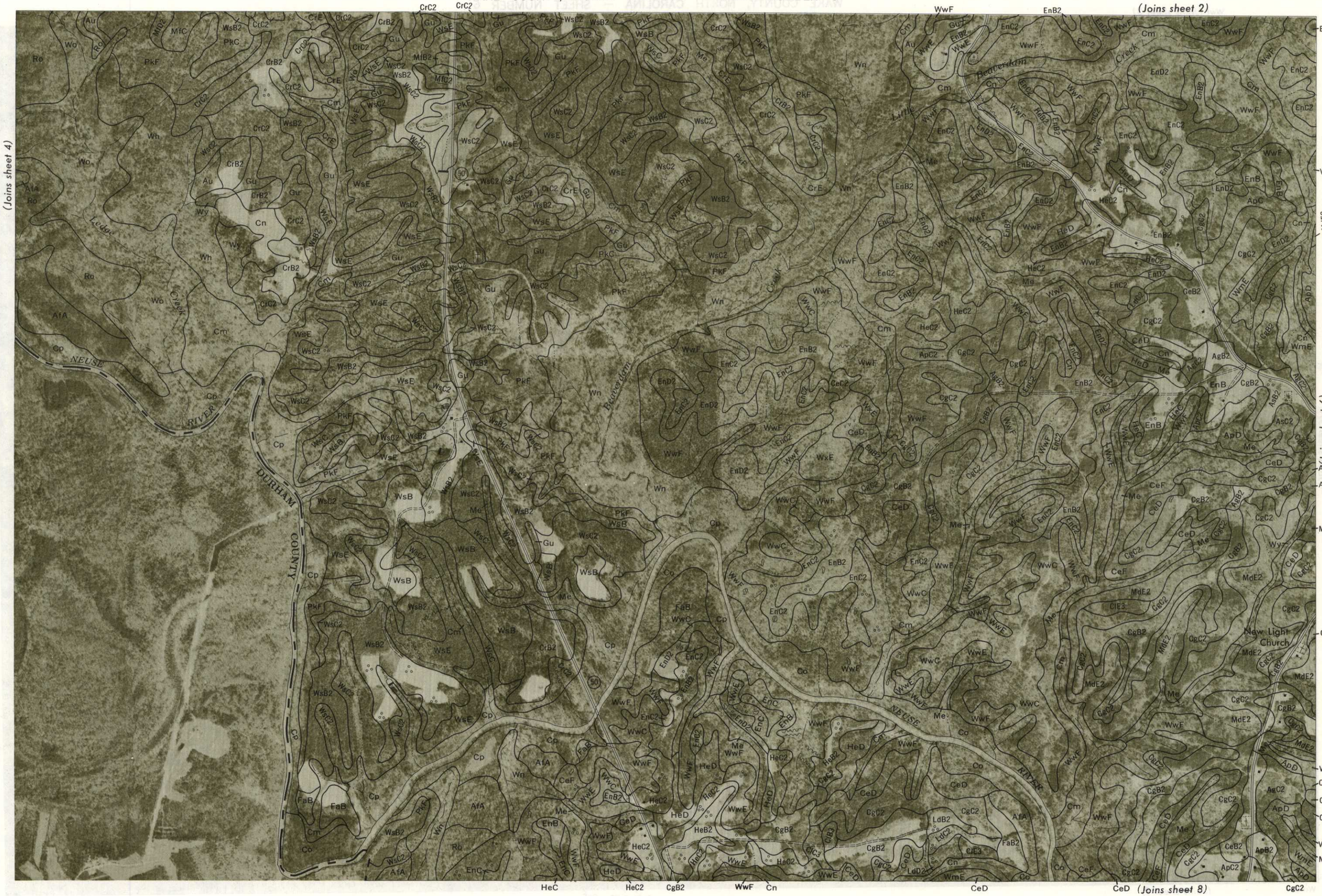
(Joins sheet 1)

(Joins sheet 5)

NEUSE RIVER

DURHAM COUNTY

WAKE COUNTY, NORTH CAROLINA — SHEET NUMBER 5



WAKE COUNTY, NORTH CAROLINA — SHEET NUMBER 6

N

1 Mile

5000 Feet

Scale 1:15840

(Joins sheet 5)

(Joins sheet 7)

(Joins sheet 9)

Free Union Church

Cedar Grove Church

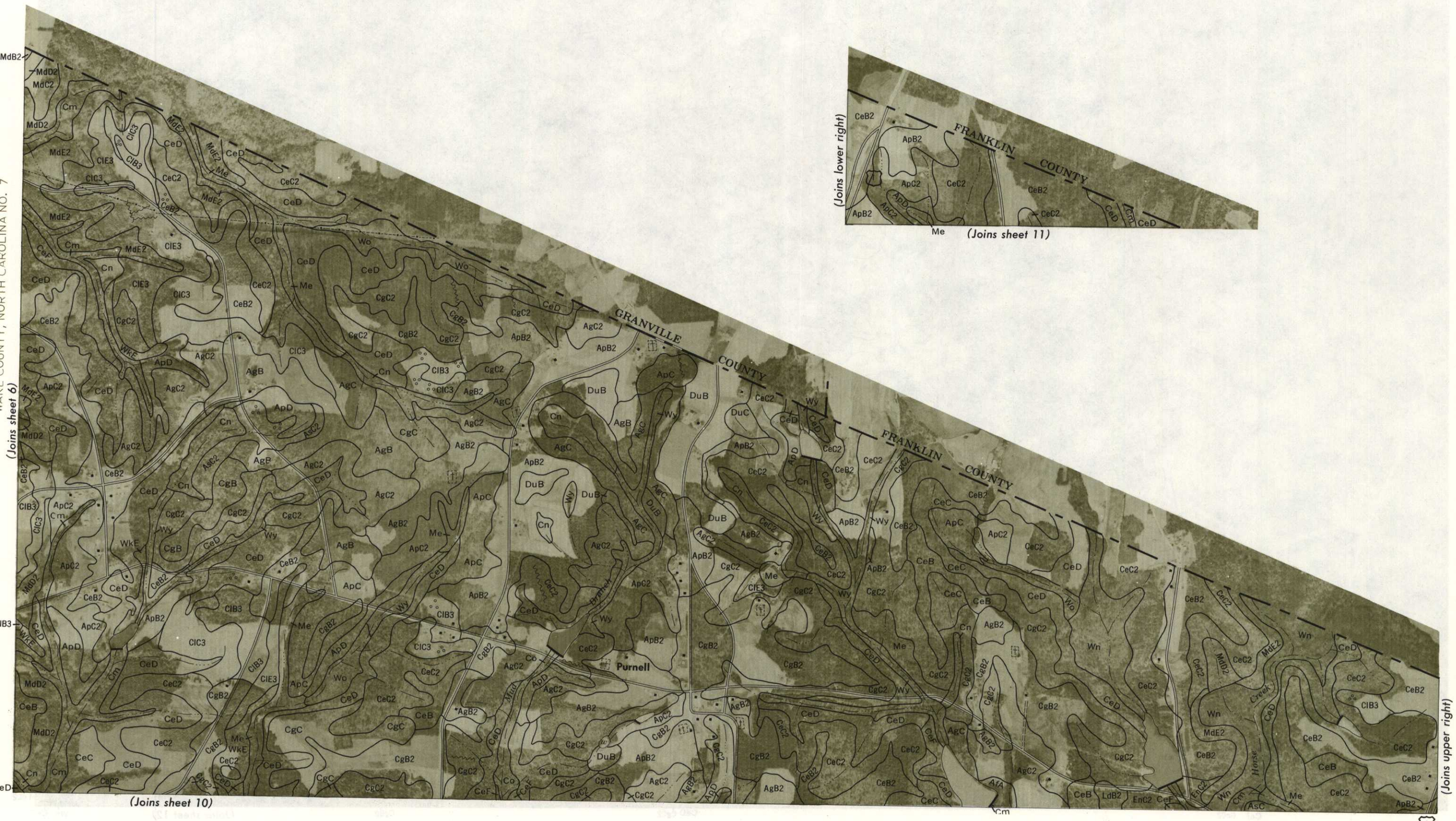
New Light Church

CRANVILLE

Buckhead Branch

Neuse River

Light Creek


GRANVILLE COUNTY
FRANKLIN COUNTY
FRANKLIN COUNTY
Purnell
(Joins sheet 6)
(Joins sheet 10)
(Joins lower right)
(Joins sheet 11)
(Joins upper right)
Scale 1:15840
1 Mile
5000 Feet


N
1 Mile
5000 Feet
Scale 1:15840
DURHAM COUNTY
WAKE COUNTY
Evans Grove Church
Wakeminster Church
CgC2 (Joins sheet 5)
(Joins sheet 9)
(Joins sheet 12)

WAKE COUNTY, NORTH CAROLINA — SHEET NUMBER 9

9

N

(Joins sheet 6)

(Joins sheet 8)

(Joins sheet 10)

(Joins sheet 13)

Stony Hill Ch

Scale 1:15840

1 Mile

5000 Feet

10

N

Scale 1:15840

1 Mile

5000 Feet

(Joins sheet 7)

(Joins sheet 9)

(Joins sheet 11)

(Joins sheet 14)

CAMP KANATA

Wake Union Church

Horse Creek

Mud Creek

Richfield Creek

Brassell Creek

Lowery Creek

(Joins inset, sheet 7)

(Joins sheet 10)

(Joins sheet 15)

(Joins inset, sheet 24)

11

N

1 Mile

5000 Feet

Scale 1:15840

FRANKLIN COUNTY

WAKE FOREST

Dubois School

Ma CITY DUMP

Wake Forest

Reservoir

Richlands Creek

Smith Creek

SEABOARD COAST LINE

ApB2 ApD CeB2 ApC2 CeC CeC2 CeD Cm MdB2 MdC2 Wo FaB2 AfA WwF CeF WwE LoB ClE3 Gu ApB ApC WkC DuB Bu AgB DuC Me CeB 1A LdB2 LdD2 ApD2 EnB2 EnC2 ClC3 ClB3 LdC2 HeB2 HeC2 WwC WmE Cn Wy WkE MdD2 ApC2 CeD CeC2 CeB2 DuB ApB2 Me Ma Cm Gu Bu Wo LoD LoB LwB LwC LwB2 WmB2 WmC2 VaB2 DuB2 DuC2 LwC2 98

N

1 Mile

5000 Feet

Scale 1:15840

0 0 ¼ 1000 ½ 2000 ¾ 3000 1 4000 5000

(Joins sheet 8)

(Joins inset, sheet 17)

(Joins sheet 13)

(Joins sheet 19)


(Joins sheet 9)
(Joins sheet 12)
(Joins sheet 14)
(Joins sheet 20)
Bayleaf
Bayleaf Church
Lower Barton Creek
Barton Creek
WwF Creek
NEUSE RIVER
Cedar Creek
Horse Creek
Mountain Creek
98
N
1 Mile
5000 Feet
Scale 1:15840

14

N

Scale 1:15840

1 Mile 5000 Feet

(Joins sheet 10)

(Joins sheet 13)

(Joins sheet 15)

(Joins sheet 21)

Falls

Richlands

Creek

RIVER

LINE

SEABOARD

WAKE COUNTY, NORTH CAROLINA — SHEET NUMBER 15

N

Scale 1:15840

1 Mile

5000 Feet

(Joins inset, sheet 24)

(Joins sheet 15)

(Joins sheet 23)

(Joins lower right)

(Joins upper left)

FRANKLIN COUNTY

Me (Joins sheet 24)

Banham

Perry Creek


DURHAM COUNTY
CeD
CgB2
CgB
CgC2
AgC
CgC
ApD
EnB2
EnC
EnD2
Cn
Cm
LdB2
WwC
LdD2
LdC2
Wy
CgC
Cp
WwF
AgB
AgC2
ApC2
HrD2
HrE
HrC2
GeC
GeD2
GeB
(Joins sheet 12)
(Joins sheet 18)


DURHAM COUNTY
WsE
Cm
Gu
Wy
WsC2
CrC2
CrB2
MfB2
MfD2
CrE
WsB2
WvD3
MfC2
MfC
MfB
CrC
CtB
Au
GrC
MfE
Me
FaB2
(Joins sheet 18)
(Joins sheet 26) MfD2
1 Mile
5000 Feet
Scale 1:15840


N
1 Mile
5000 Feet
Scale 1:15840
(Joins inset, sheet 17)
(Joins sheet 17)
(Joins sheet 19)
(Joins sheet 27)
DURHAM COUNTY
Hickory Grove Church
Leesville
REPLAWN MEMORIAL GARDENS
Sucahnore Creek
70


(Joins sheet 12)
(Joins sheet 18)
(Joins sheet 20)
(Joins sheet 28)
Soapstone Church
Co Creek
Barton
Lower
50
N
1 Mile
5000 Feet
Scale 1:15840

WAKE COUNTY, NORTH CAROLINA — SHEET NUMBER 20

20

N

(Joins sheet 13)

(Joins sheet 19)

(Joins sheet 21)

(Joins sheet 29)

Scale 1:15840

1 Mile

5000 Feet

Lovely Hill Church

Bayleaf Fire Tower

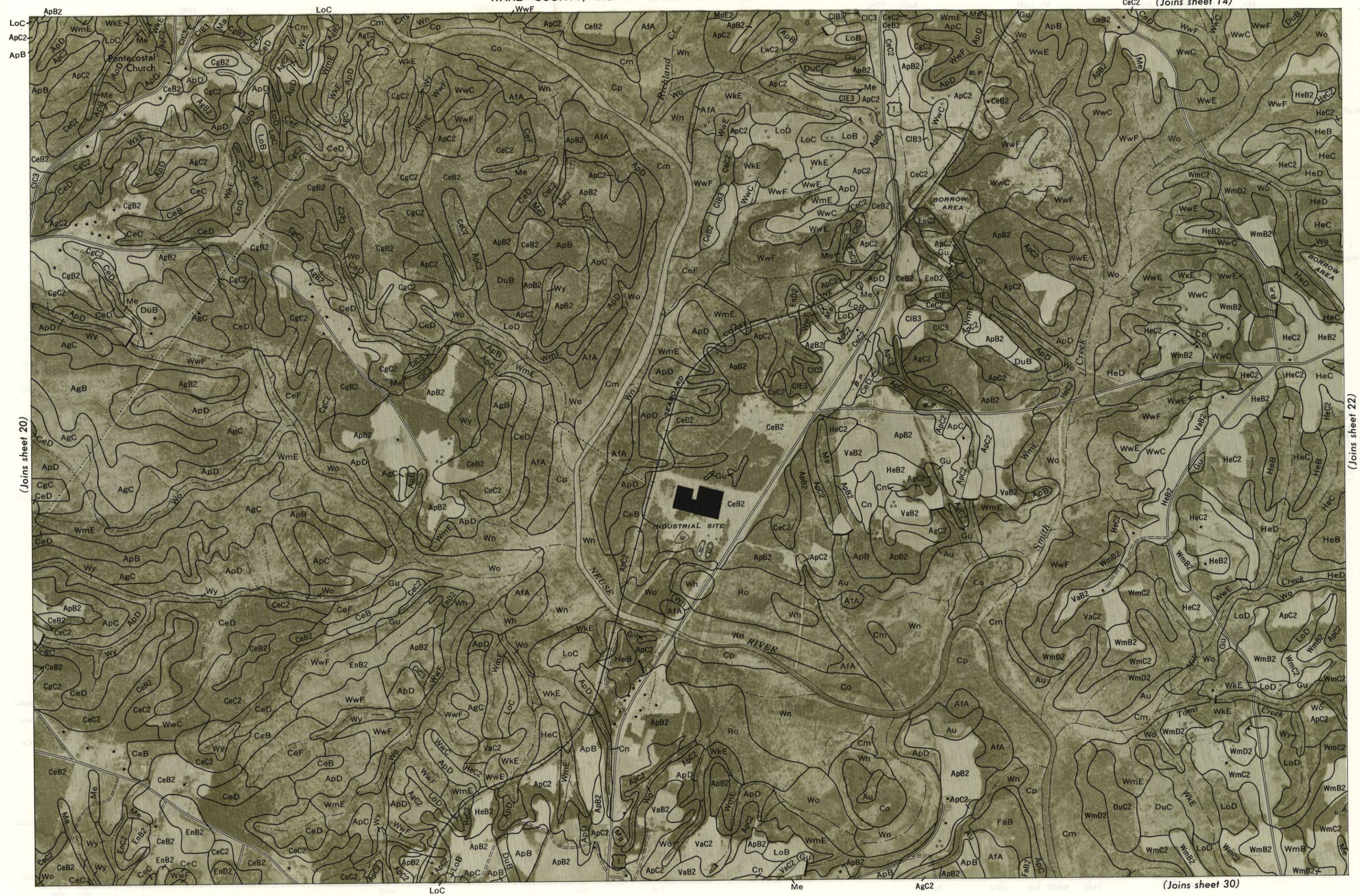
Six Forks

Mt Pleasant Church

Mt Vernon Church

Creek

Honeycutt


Pentecostal Church
INDUSTRIAL SITE
BORROW AREA
BORROW AREA
NEUSE RIVER
Rocky Ford Creek
Smith Creek
Toms Creek
SEABOARD
B.P.
(Joins sheet 14)
(Joins sheet 20)
(Joins sheet 22)
(Joins sheet 30)
LoC
Me
AgC2
1 Mile
5000 Feet
Scale 1:15840

22

N

Scale 1:15840

1 Mile

5000 Feet

(Joins sheet 15)

(Joins sheet 21)

(Joins sheet 23)

(Joins sheet 31)

Walkers Crossroads

Rolesville

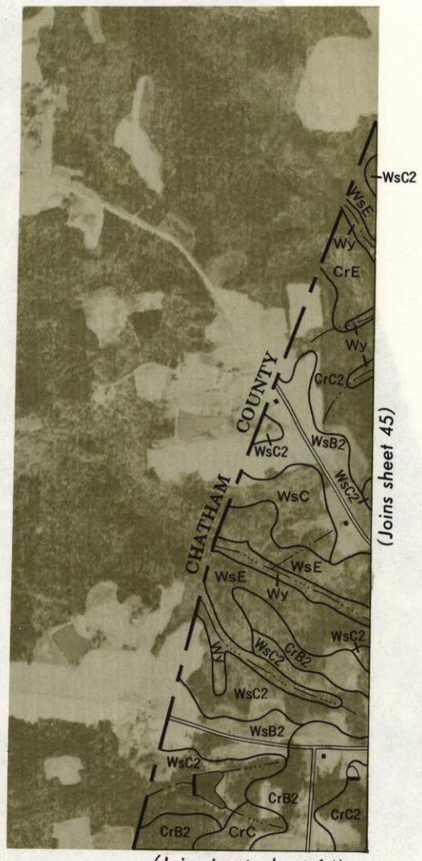
Rolesville Church

Mill Creek

WAKE COUNTY, NORTH CAROLINA — SHEET NUMBER 23

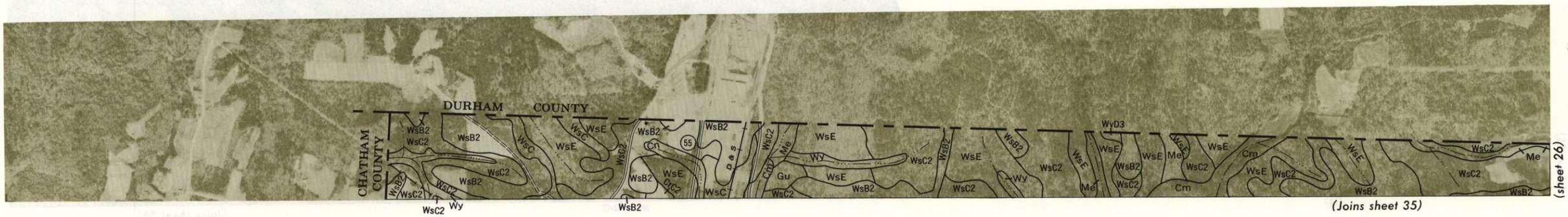
Soil survey by the Soil Conservation Service, United States Department of Agriculture, and the North Carolina Agricultural Experiment Station.
WAKE COUNTY, NORTH CAROLINA NO. 23


(Joins inset, sheet 16)
(Joins sheet 23)
(Joins sheet 33)
(Joins sheet 11)
(Joins sheet 16)
FRANKLIN COUNTY
FRANKLIN COUNTY
Moccasin Creek
Little Fork Creek
Gays Pond
Scale 1:15840
1 Mile
5000 Feet



(Joins sheet 45)

(Joins inset, sheet 64)



(sheet 26)

(Joins sheet 35)

25

N

1 Mile

5000 Feet

Scale 1:15840

0 1/4 1/2 3/4 1 0 1000 2000 3000 4000 5000


(Joins sheet 17)
(Joins sheet 27)
(sheet 25)
(Joins sheet 36)
DURHAM COUNTY
DURHAM COUNTY
Pleasant Grove Church
Little Briar Creek
Sandy Creek
Iron Mine Branch
RALEIGH - DURHAM AIRPORT
Scale 1:15840
1 Mile
5000 Feet

WAKE COUNTY, NORTH CAROLINA — SHEET NUMBER 27

27

N

(Joins sheet 18)

(Joins sheet 26)

(Joins sheet 28)

(Joins sheet 37)

WILLIAM B UMSTEAD STATE PARK

RALEIGH-DURHAM AIRPORT

Mt Herman Ch

Ebenezer Church

Swearingame Creek

Anne Lake

1 Mile

5000 Feet

Scale 1:15840

WAKE COUNTY, NORTH CAROLINA — SHEET NUMBER 28

28

N

(Joins sheet 19)

(Joins sheet 27)

(Joins sheet 29)

(Joins sheet 38)

Scale 1:15840

1 Mile 5000 Feet

Lynn Lake

Grove Cr

Jeffery Grove School

Mt Zion Church

Pleasant Grove Church

RALEIGH MEMORIAL PARK CEMETERY

WAKE COUNTY, NORTH CAROLINA — SHEET NUMBER 29

29

N

(Joins sheet 20)

(Joins sheet 28)

(Joins sheet 30)

(Joins sheet 39)

Bethlehem Church

Scale 1:15840

1 Mile

5000 Feet

30

WAKE COUNTY, NORTH CAROLINA — SHEET NUMBER 30

N

Scale 1:15840

1 Mile 5000 Feet

0 1000 2000 3000 4000 5000

¼ ½ ¾ 1

(Joins sheet 21)

(Joins sheet 29)

(Joins sheet 31)

(Joins sheet 40)

Lake Gresham

GRANITE QUARRY

Neuse Church

Neuse Crossroads

Perry Creek

NEUSE RIVER

SEABOARD COAST LINE

401

WAKE COUNTY, NORTH CAROLINA — SHEET NUMBER 31

32

N

1 Mile

5000 Feet

Scale 1:15840

(Joins sheet 23)

(Joins sheet 31)

(Joins sheet 33)

(Joins sheet 42)

Fowlers Crossroads

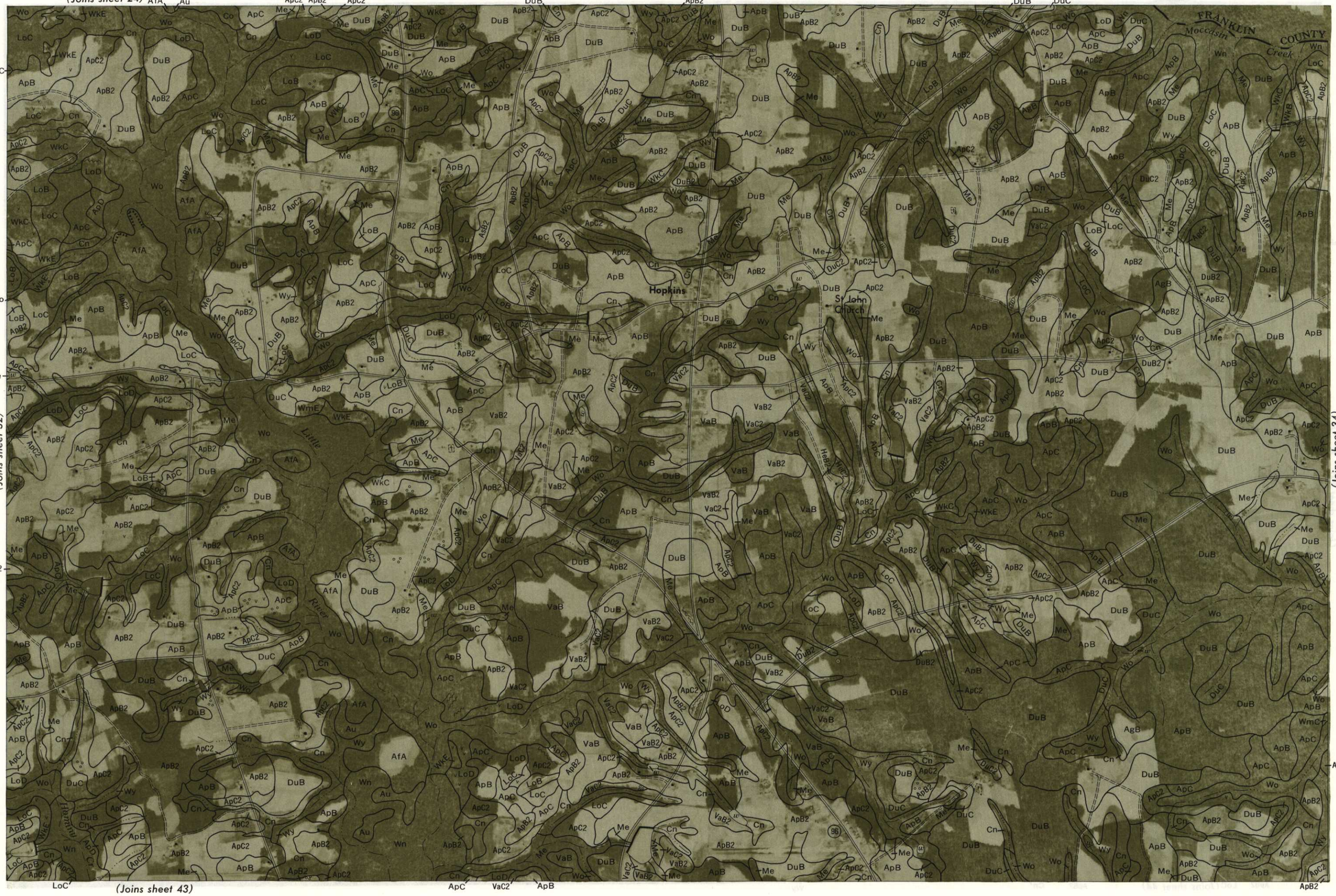
Penny Hill Lake

Fowler Creek

Buffalo Creek

Perrys Pond

Hominy Creek


(Joins sheet 24)
(Joins sheet 32)
(Joins sheet 43)
(Joins sheet 34)
FRANKLIN COUNTY
Moccasin Creek
Hopkins
St John Church
Little River
Harris Mill Run
1 Mile
5000 Feet
Scale 1:15840
N
33

N

1 Mile

5000 Feet

Scale 1:15840

(Joins sheet 33)

Moccasin Creek

FRANKLIN COUNTY

Moccasin Creek

(Joins sheet 44)

WAKE COUNTY, NORTH CAROLINA — SHEET NUMBER 35

35

N

(Joins sheet 25)

(Joins sheet 36)

(Joins sheet 45)

CHATHAM COUNTY

DURHAM

Kit Creek

Nancy Branch

SOUTHERN

55

1 Mile

5000 Feet

Scale 1:15840

N

Scale 1:15840

1 Mile 5000 Feet

0 1000 2000 3000 4000 5000

(Joins sheet 26)

(Joins sheet 35)

(Joins sheet 37)

(Joins sheet 46)

Sorrels Grove Church

Shiloh Ch

SOUTHERN

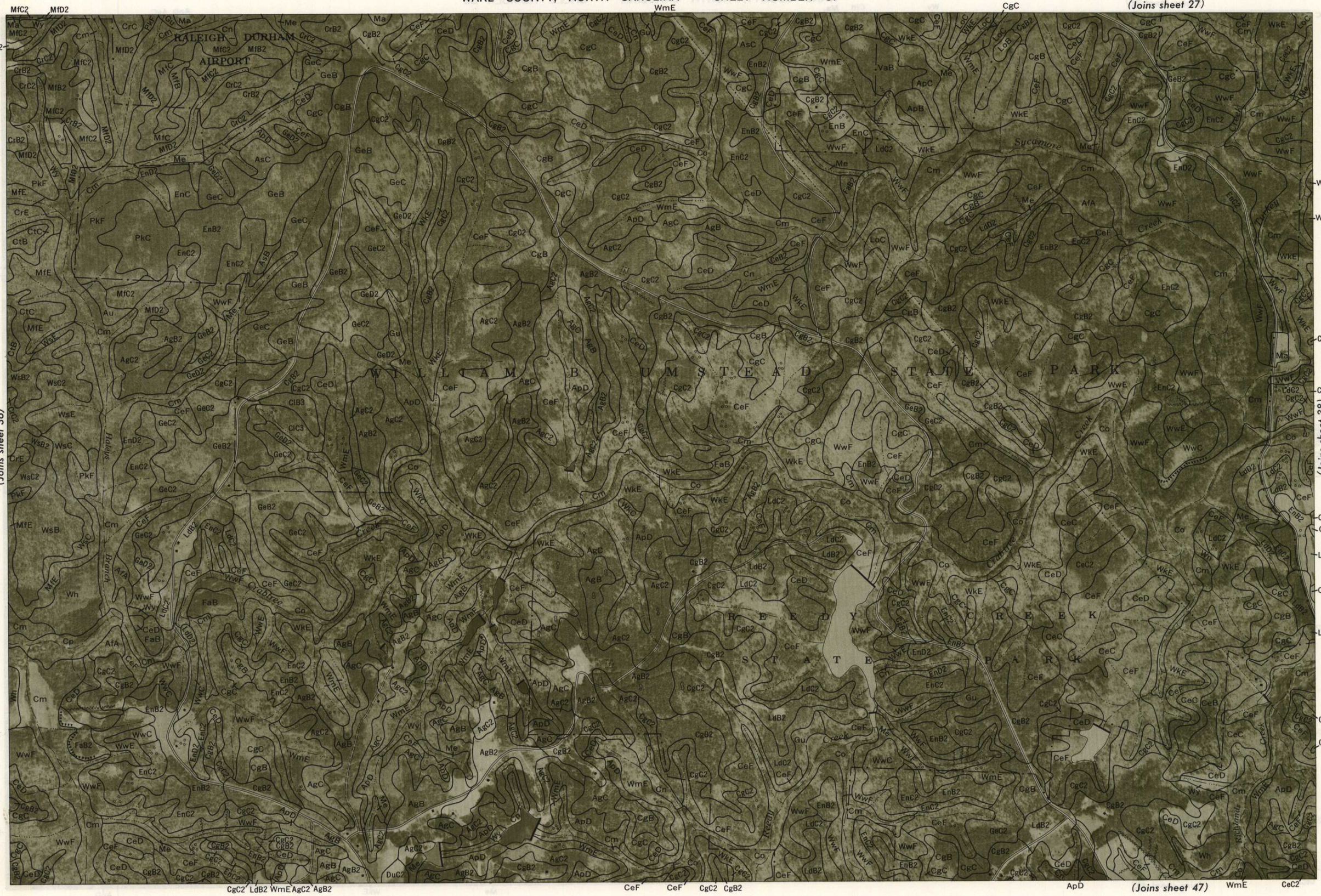
Stirrup Iron Creek

Brier Creek

Crabtree Creek

PkF WvD3 MfE WwF

WAKE COUNTY, NORTH CAROLINA — SHEET NUMBER 37



38

N

WAKE COUNTY, NORTH CAROLINA — SHEET NUMBER 38

(Joins sheet 28)

(Joins sheet 37)

(Joins sheet 39)

(Joins sheet 48)

Scale 1:15840

1 Mile

5000 Feet

GRANITE QUARRY

Creek

Branch

Mine

WAKE COUNTY, NORTH CAROLINA — SHEET NUMBER 39

(Joins sheet 29)

(Joins sheet 38)

(Joins sheet 40)

(Joins sheet 49)

39

N

Scale 1:15840

1 Mile

5000 Feet

Effie Green Sch

Hudson Memorial Ch

Trinity Church

St Marks Church

Millbrook

Wake Chapel

Crabtree

WAKE COUNTY, NORTH CAROLINA — SHEET NUMBER 40

(40)

N

1 Mile

5000 Feet

Scale 1:15840

0 ¼ ½ ¾ 1

(Joins sheet 30)

(Joins sheet 39)

(Joins sheet 41)

(Joins sheet 50)

St Matthews Church

New Hope Church

Beaman Lake

Hodges Mill Cr

Bellvedam Creek

Rocky Creek

NEUSE RIVER

WAKE COUNTY, NORTH CAROLINA — SHEET NUMBER 41

41

N

(Joins sheet 31)

(Joins sheet 40)

(Joins sheet 42)

(Joins sheet 51)

Six Forks

Trubys Lakes

Hodges Mill Creek

Pet Crossroads

water

1 Mile

5000 Feet

Scale 1:15840

N

(Joins sheet 32)

Perrys Pond

Riley Hill School

Riley Hill Church

Buffalo Creek

Robertsons Pond

Becky Branch

(Joins sheet 41)

(Joins sheet 43)

(Joins sheet 52)

1 Mile

5000 Feet

Scale 1:15840

0 1/4 1/2 3/4 1

0 1000 2000 3000 4000 5000

WAKE COUNTY, NORTH CAROLINA — SHEET NUMBER 43

WAKE COUNTY, NORTH CAROLINA NO. 43


(44)
N
1 Mile
5000 Feet
Scale 1:15840
(Joins sheet 43)
(Joins sheet 34)
(Joins sheet 54)
Beaver Chapel
Wakefield Ch
Shepard School
ZEBULON
Beaverdam Creek
Maccasin Creek
FRANKLIN COUNTY
SOUTHERN RAILWAY
NORFOLK
64
39
97
264
96

WAKE COUNTY, NORTH CAROLINA — SHEET NUMBER 45

45

N

1 Mile

5,000 Feet

Scale 1:15840

(Joins sheet 36)

(Joins sheet 45)
(Joins sheet 47)
(Joins sheet 56)

WAKE COUNTY, NORTH CAROLINA — SHEET NUMBER 47

WAKE COUNTY, NORTH CAROLINA — SHEET NUMBER 48

48

N

Scale 1:15840

1 Mile 5000 Feet

(Joins sheet 38)

(Joins sheet 47)

(Joins sheet 49)

(Joins sheet 58)

Frances Lacy School

Ridgewood Church

MEREDITH COLLEGE

STATE FAIRGROUNDS

SEABOARD COAST LINE

SOUTHERN

Substation

Lake Boone

RALEIGH

(Joins sheet 39)

(Joins sheet 48)

(Joins sheet 50)

(Joins sheet 59)

N

Scale 1:15840

1 Mile

5000 Feet

50

N

1 Mile

5000 Feet

Scale 1:15840

(Joins sheet 40)

(Joins sheet 49)

(Joins sheet 51)

(Joins sheet 60)

Wilders Grove

Hillcrest Church

Milburnie

Neuse River

Beaver Dam Lake

Neuseoda Lake

NORFOLK SOUTHERN RAILROAD

64

64A

401


(Joins sheet 41)
(Joins sheet 50)
(Joins sheet 52)
(Joins sheet 61)
N
1 Mile
5000 Feet
Scale 1:15840
Neuseoca Lake
Beaverdam Creek
GRANITE QUARRY
Malbys Cross Roads
Ch
Lockhart School
Ma
Knightdale
NORFOLK SOUTHERN
64
WmB2
WmC2
LoC
LoD
LwB
LwC
DuB
ApB
ApC2
ApB2
DuC2
DuB2
VaB2
VaC2
WkE
WkC
Wo
Wy
Me
Cn
Wn
Au
Gu
Ma
AfA
WaB

52

N

Scale 1:15840

1 Mile 5,000 Feet

(Joins sheet 42)

(Joins sheet 51)

(Joins sheet 53)

(Joins sheet 62)

Robertsons Pond

Buffalo Creek

Marks Creek

Landing Strip

Hephzibah Church

Eagle Rock

NORFOLK SOUTHERN

WAKE COUNTY, NORTH CAROLINA

WAKE COUNTY, NORTH CAROLINA — SHEET NUMBER 53

WAKE COUNTY, NORTH CAROLINA — SHEET NUMBER 54

(54)

N

1 Mile

5000 Feet

Scale 1:15840

0 0 ¼ 1000 ½ 2000 ¾ 3000 1 4000 5000

(Joins sheet 44)

(Joins sheet 53)

(Joins inset, sheet 63)

ZEBULON

St Paul Church

Marys Grove Church

Little

NORFOLK SOUTHERN

Crabtree Creek

FRANKLIN COUNTY

NASH COUNTY

JOHNSTON COUNTY


(Joins sheet 45)
(Joins inset, sheet 64)
(Joins sheet 56)
(Joins sheet 65)
Green Level
Green Level Ch
White Oak Church
Upchurch
BORROW AREA
Creek
Branch
Scale 1:15840
1 Mile
5000 Feet

WAKE COUNTY, NORTH CAROLINA — SHEET NUMBER 56

WAKE COUNTY, NORTH CAROLINA — SHEET NUMBER 57

WAKE COUNTY, NORTH CAROLINA — SHEET NUMBER 58

58

N

(Joins sheet 48)

(Joins sheet 57)

(Joins sheet 59)

(Joins sheet 68)

1 Mile

5000 Feet

Scale 1:15840

RALEIGH

North Carolina State College

LAKE RALEIGH

LAKE JOHNSON

Walnut Creek

TRANSMISSION TOWER

PULLEN PARK

STATE HOSPITAL

SEABOARD SOUTHERN COAST

SOUTHERN

NORFOLK

Substation

WAKE COUNTY, NORTH CAROLINA — SHEET NUMBER 59

WAKE COUNTY, NORTH CAROLINA — SHEET NUMBER 60

60

N

Cp (Joins sheet 50)

(Joins sheet 59)

(Joins sheet 61)

(Joins sheet 70)

Scale 1:15840

1 Mile

5000 Feet

WAKE MEMORIAL HOSPITAL

CREEK

CRABTREE

NORFOLK SOUTHERN

BORROW AREA

NEUSE RIVER

Carolina Lake

Cokesbury Church

Samana Church

Worthdale Elementary School

SEWAGE DISPOSAL PLANT

Walnut Creek

WAKE COUNTY, NORTH CAROLINA — SHEET NUMBER 61

61

N

(Joins sheet 51)

(Joins sheet 60)

(Joins sheet 62)

(Joins sheet 71)

Knightdale

Knightdale High School

NORFOLK SOUTHERN

Poplar Creek

1 Mile

5000 Feet

Scale 1:15840

62

WAKE COUNTY, NORTH CAROLINA — SHEET NUMBER 62

N

Scale 1:15840

1 Mile

5000 Feet

0 1000 2000 3000 4000 5000

1/4 1/2 3/4 1

(Joins sheet 52)

(Joins sheet 61)

(Joins sheet 63)

(Joins sheet 72)

NORFOLK SOUTHERN

Buffalo Creek

Morfes Creek

WkE Creek

Lake Myra

Central Church

B.P.

WAKE COUNTY, NORTH CAROLINA — SHEET NUMBER 63

63

N

WENDELL

Pleasant Grove Church

Carver School

Lake Glad

WENDELL GOLF COURSE

Buffalo Creek

Little River

GRANITE QUARRY

NORFOLK SOUTHERN

JOHNSTON COUNTY

(Joins sheet 53)

(Joins sheet 62)

(Joins lower left)

(Joins upper right)

(Joins sheet 54)

(Joins inset, sheet 72)

1 Mile

5000 Feet

Scale 1:15840

64

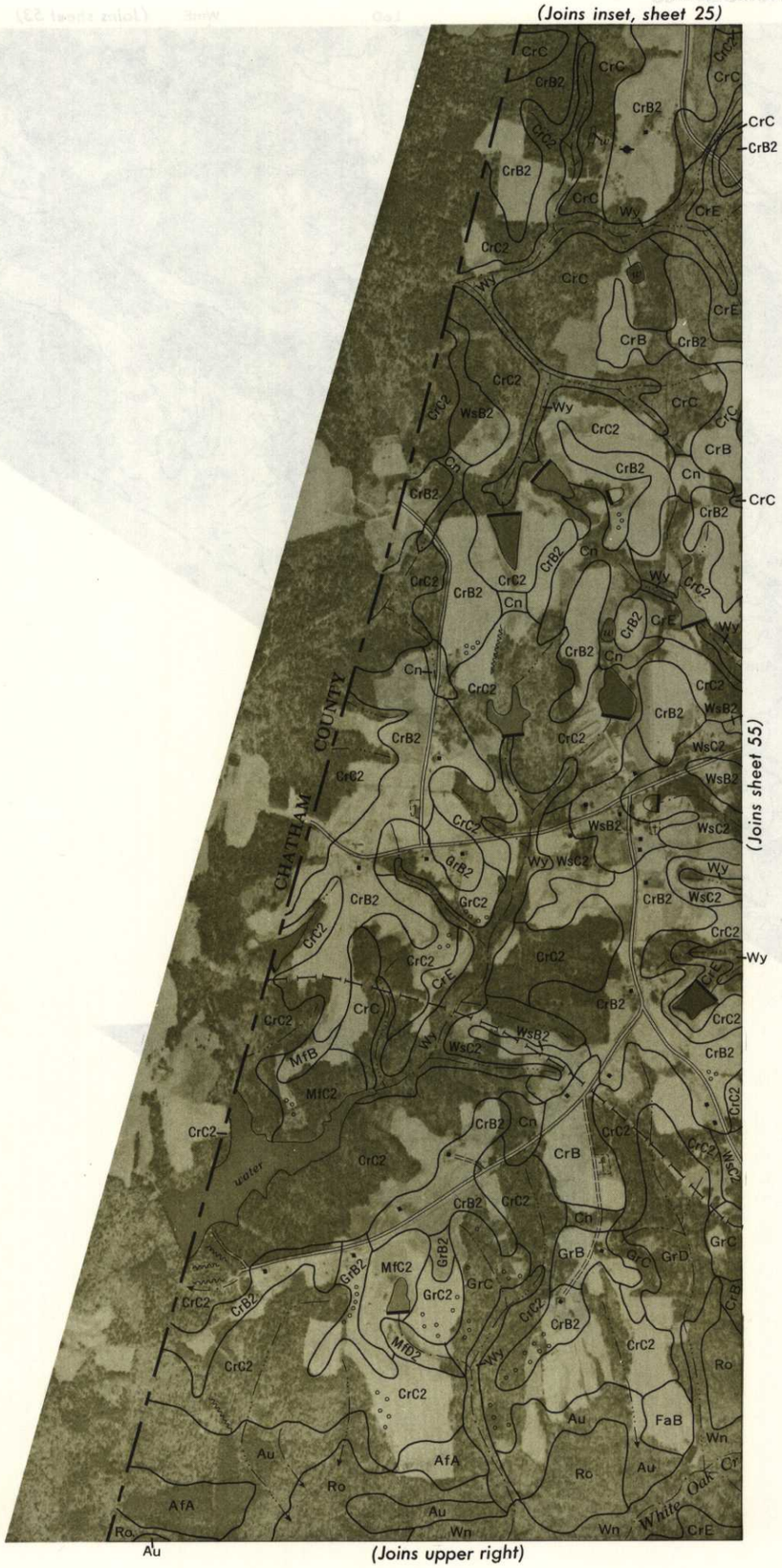
N

1 Mile

5000 Feet

Scale 1:15840

(Joins inset, sheet 25)



(Joins sheet 55)

(Joins upper right)

(Joins lower left)

(Joins sheet 65)

(Joins sheet 73)

WAKE COUNTY, NORTH CAROLINA — SHEET NUMBER 65

65

N

(Joins sheet 55)

(Joins sheet 64)

(Joins sheet 66)

(Joins sheet 74)

1 Mile

5000 Feet

Scale 1:15840

WAKE COUNTY, NORTH CAROLINA NO. 65


(Joins sheet 56)
(Joins sheet 65)
(Joins sheet 67)
(Joins sheet 75)
Salem Church
APEX
Apex Church
Junior High School
SOUTHERN
DURHAM AND
SEABOARD
COAST LINE
Creek
South
Scale 1:15840
1 Mile
5000 Feet
N

WAKE COUNTY, NORTH CAROLINA — SHEET NUMBER 67

WAKE COUNTY, NORTH CAROLINA — SHEET NUMBER 68

N

Scale 1:15840
1 Mile
5000 Feet

(Joins sheet 58)

(Joins sheet 67)

(Joins sheet 69)

(Joins sheet 77)

Watts Chapel

Mt Olivet Church

Pairway Acres

St Johns Church

RALEIGH MUNICIPAL AIRPORT

GOLF COURSE

SOUTHERN

NORFOLK

Inwood Church

Yates Millpond

(Joins sheet 59)

(Joins sheet 68)

(Joins sheet 70)

(Joins sheet 78)

69

N

1 Mile

5000 Feet

Scale 1:15840

Parkers Pond

Carolina Pines Church

East Parkland

MONTLAWN MEMORIAL PARK

RALEIGH MUNICIPAL AIRPORT

N C Blind & Deaf School

Cloverdale

CEMETERY

(Joins sheet 60)

(Joins sheet 69)

(Joins sheet 71)

(Joins sheet 79)

70

N

1 Mile

5000 Feet

Scale 1:15840

0 1000 2000 3000 4000 5000

0 ¼ ½ ¾ 1

Walnut Creek

Big Branch

NEUSE RIVER

Ebenezer Church

WAKE COUNTY, NORTH CAROLINA — SHEET NUMBER 71

72

N

Scale 1:15840

1 Mile

5000 Feet

(Joins sheet 62)

(Joins sheet 71)

(Joins inset, sheet 80)

(Joins sheet 63)

(Joins upper right)

Good Hope Church

Shotwell

Marks Creek

JOHNSTON COUNTY

(Joins sheet 64)

(Joins sheet 74)

(Joins sheet 81)

73

N

1 Mile

5000 Feet

Scale 1:15840

1 0 5000

¼ 1000

½ 2000

¾ 3000

1 4000

5000

N

Scale 1:15840

1 Mile 5000 Feet

0 0 ¼ ½ ¾ 1

(Joins sheet 65)

(Joins sheet 73)

(Joins sheet 75)

(Joins sheet 82)

Mt Zion Church

Friendship

Little Beaver Creek

Big Branch

COAST LINE

SEABOARD

1

MfC2 GrC MfC2 MfD2 GrB2 CrC2 CrE MyC2 CtC

WAKE COUNTY, NORTH CAROLINA — SHEET NUMBER 75

75

N

(Joins sheet 74)

(Joins sheet 66)

(Joins sheet 76)

(Joins sheet 83)

1 Mile

5000 Feet

Scale 1:15840


(Joins sheet 67)
N
1 Mile
5000 Feet
Scale 1:15840
Swift Creek Church
Swift Creek
LAKE WHEELER
(Joins sheet 75)
(Joins sheet 77)
Wy (Joins sheet 84)
WkE
WmE
AsC2
ApD
CgC2

WAKE COUNTY, NORTH CAROLINA — SHEET NUMBER 77

77

N

(Joins sheet 68)

(Joins sheet 76)

(Joins sheet 78)

(Joins sheet 85)

LAKE WHEELER

LAKE WHEELER PARK

Yates Millpond

Myatt Church

Fellowship Ch

Colonial Heights

Little Swift Creek

Swift Creek

Scale 1:15840

1 Mile

5000 Feet

(Joins sheet 69)

WAKE COUNTY, NORTH CAROLINA — SHEET NUMBER 78

N

1 Mile

5000 Feet

Scale 1:15840

0 0 ¼ 1000 ½ 2000 ¾ 3000 1 4000 5000

GARNER

Echo Heights

Bandora Springs School

Poplar Springs Church

PINE HURST PARK

SOUTHERN

Little

Swift

Creek

Michaels

B.P.

(Joins sheet 77)

(Joins sheet 79)

(Joins sheet 86)


EnD2
(Joins sheet 70)
(Joins sheet 78)
(Joins sheet 80)
(Joins sheet 87)
GRANITE QUARRY
Garner High School
Springfield Church
Auburn Church
Auburn
Mt Auburn School
Mt Moriah Ch
SOUTHERN
White Oak Creek
79
N
1 Mile
5000 Feet
Scale 1:15840

WAKE COUNTY, NORTH CAROLINA — SHEET NUMBER 80

80

N

Scale 1:15840

1 Mile 5000 Feet

(Joins sheet 71)

(Joins sheet 79)

(Joins lower left)

(Joins upper right)

(Joins sheet 72)

(Joins inset, sheet 94)

BORROW AREA

NEUSE RIVER

Tippetts Chapel

JOHNSTON COUNTY

(Joins sheet 73)

(Joins sheet 82)

(Joins sheet 88)

81

N

1 Mile

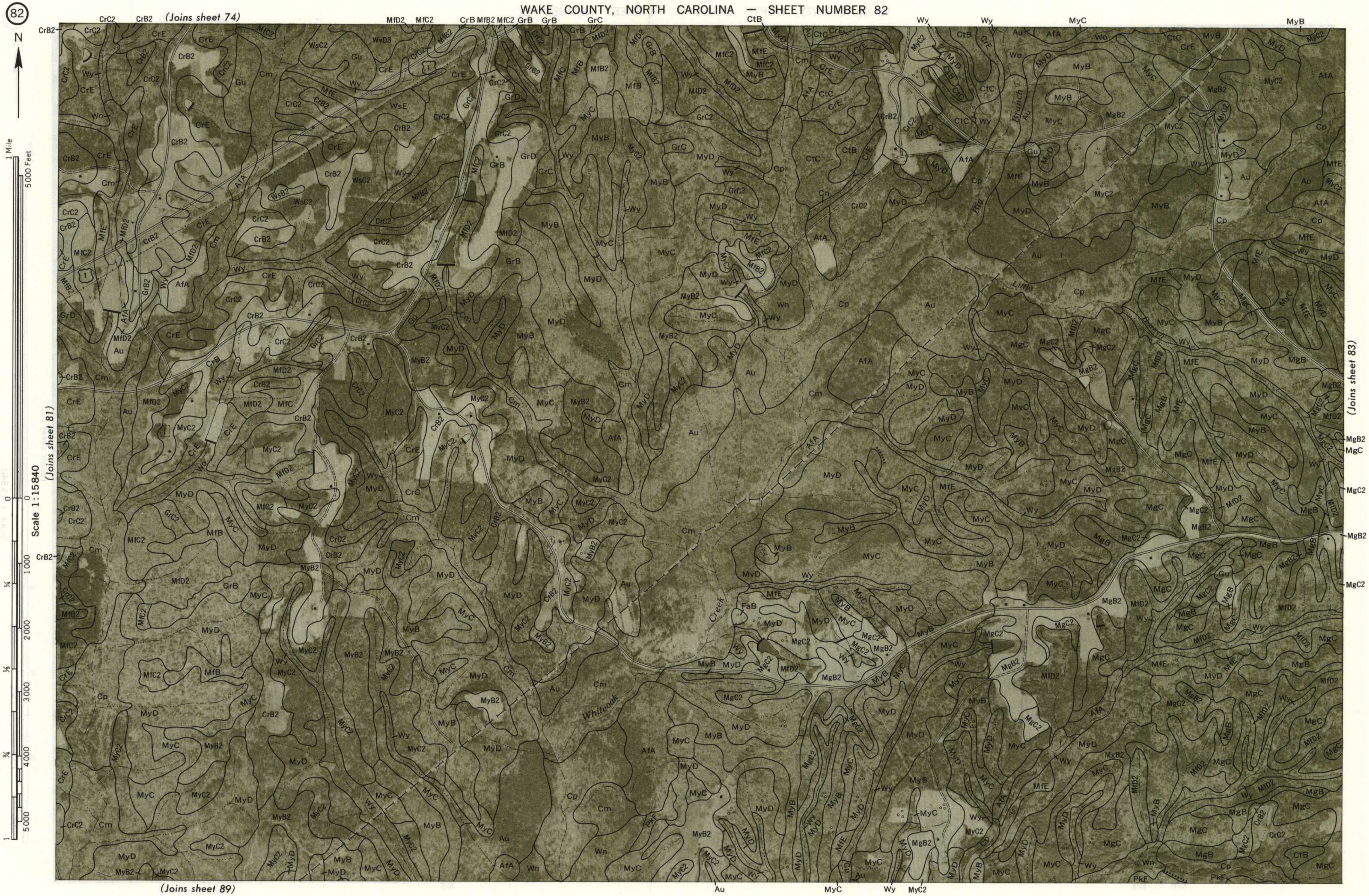
5000 Feet

Scale 1:15840

1 ¾ ½ ¼ 0 0 ¼ ½ ¾ 1

5000 4000 3000 2000 1000 0 0

WAKE COUNTY, NORTH CAROLINA — SHEET NUMBER 82



WAKE COUNTY, NORTH CAROLINA — SHEET NUMBER 83

(Joins sheet 75)

(Joins sheet 82)

(Joins sheet 84)

(Joins sheet 90)

83

N

1 Mile

5000 Feet

Scale 1:15840

Holly Springs

Holly Springs School

Sunset Lake

Middle Creek

84

WAKE COUNTY, NORTH CAROLINA — SHEET NUMBER 84

(Joins sheet 76)

(Joins sheet 83)

(Joins sheet 85)

(Joins sheet 91)

N

1 Mile

5000 Feet

Scale 1:15840

0 0 ¼ 1000 ½ 2000 ¾ 3000 1 4000 5000

Bells Lake

West Lake

Sunset Lake

Camp Branch

Middle Creek

WAKE COUNTY, NORTH CAROLINA — SHEET NUMBER 85

85

N

(Joins sheet 77)

(Joins sheet 84)

(Joins sheet 86)

(Joins sheet 92)

Catawba Springs

McCullers Crossroads

McCullers

Wentworth Church

Vance School

Williams Crossroads

Holland Church

Industrial School

Swift Cr

Norfolk Southern

Panther Branch

Mills Branch

1 Mile

5000 Feet

Scale 1:15840


(Joins sheet 78)
LAKE BENSON
GARNER COUNTRY CLUB
New Bethel Church
Pumping Station
Swift Creek
Neuse River
(Joins sheet 85)
(Joins sheet 87)
(Joins sheet 93)
N
1 Mile
5000 Feet
Scale 1:15840

WAKE COUNTY, NORTH CAROLINA — SHEET NUMBER 87

88

N

WAKE COUNTY, NORTH CAROLINA — SHEET NUMBER 88

(Joins sheet 81)

1 Mile 5000 Feet

Scale 1:15840

(Joins inset, sheet 95)

(Joins sheet 89)

(Joins sheet 95)

CHATHAM COUNTY

NORFOLK Southern

Thomas Creek

Whiteoak Creek

Little Whiteoak Creek

WAKE COUNTY, NORTH CAROLINA — SHEET NUMBER 89

89

N

(Joins sheet 82)

(Joins sheet 88)

(Joins sheet 90)

(Joins sheet 96)

Hallemans Crossroads

Whiteoak Creek

Carry Creek

1 Mile 5000 Feet

Scale 1:15840

N

1 Mile 5000 Feet

Scale 1:15840

(Joins sheet 83)

(Joins sheet 89)

(Joins sheet 91)

(Joins sheet 97)

Holly Springs

Bass Lake

Sunset Lake

Airstrip

(Joins sheet 84)

(Joins sheet 90)

(Joins sheet 92)

(Joins sheet 98)

91

N

1 Mile

5000 Feet

Scale 1:15840

1 5000 ¾ 4000 ½ 3000 ¼ 2000 0 1000 0

New Providence Church

Pleasant Grove Church

Terrible Creek

Middle Creek

Johnsons Pond

WAKE COUNTY, NORTH CAROLINA — SHEET NUMBER 92

WAKE COUNTY, NORTH CAROLINA — SHEET NUMBER 93

93

N

(Joins sheet 86)

(Joins sheet 92)

(Joins sheet 94)

(Joins sheet 100)

JOHNSTON CO

Juniper Level Church

Juniper

Turner Memorial Church

Wooten Chapel

Swift Creek

1 Mile

5000 Feet

Scale 1:15840

94

N

WAKE COUNTY, NORTH CAROLINA — SHEET NUMBER 94

1 Mile

5000 Feet

Scale 1:15840

0 0 1000 2000 3000 4000 5000

1/4 1/2 3/4 1


(Joins inset
CHATHAM COUNTY
CHATHAM CO
(Joins upper left)
(Joins sheet 88)
(Joins sheet 88)
(Joins sheet 96)
White Oak Creek
Cary
Jack Tom Creek
SOUTHERN RAILWAY
Scale 1:15840
1 Mile
5000 Feet
N

WAKE COUNTY, NORTH CAROLINA — SHEET NUMBER 96

N

1 Mile
5000 Feet
Scale 1:15840

(Joins sheet 95)

(Joins sheet 89)

(Joins sheet 97)

(Joins sheet 101)

CHATHAM CO

HARNETT COUNTY

Sweet Springs Church

Buri

Jim Branch

Buckhorn Branch

NORFOLK SOUTHERN

(Joins sheet 90)

(Joins sheet 96)

(Joins sheet 98)

(Joins sheet 101)

97

N

1 Mile

5000 Feet

Scale 1:15840

Wibon

Bazzel Church

TV & Radio Tower

Radio Tower

Wake Chapel

Fuquay Varina Church

FUQUAY SPRINGS

Fuquay Spring School

St Augustine Church

SOUTHERN

DURHAM AND

NORFOLK SOUTHERN

CEMETERY

98

N

WAKE COUNTY, NORTH CAROLINA — SHEET NUMBER 98

(Joins sheet 91)

(Joins sheet 97)

(Joins sheet 99)

(Joins sheet 102)

1 Mile

5000 Feet

Scale 1:15840

0 ¼ ½ ¾ 1

0 1000 2000 3000 4000 5000

FUQUAY SPRINGS

Willow Springs

New Hope Church

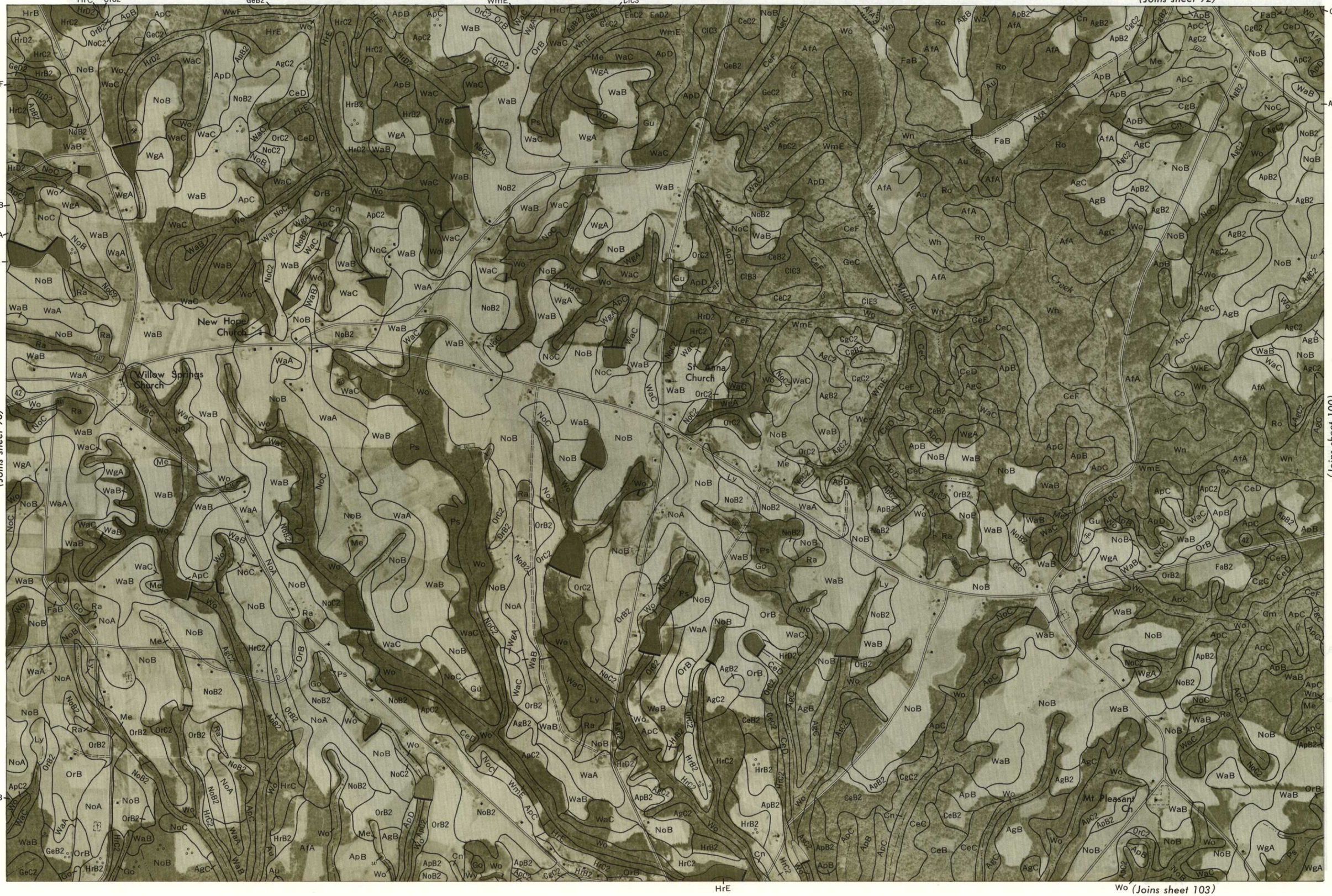
Willow Springs Sch

SOUTHERN

NORFOLK

BORROW AREA

WAKE COUNTY, NORTH CAROLINA — SHEET NUMBER 99



WAKE COUNTY, NORTH CAROLINA — SHEET NUMBER 100

100

N

Scale 1:15840

1 Mile 5000 Feet

0 1/4 1/2 3/4 1

(Joins sheet 93)

(Joins sheet 99)

(Joins upper right)

(Joins lower left)

(Joins sheet 103)

JOHNSTON COUNTY

Middle Creek Church

Little Creek

Middle Creek

WAKE COUNTY, NORTH CAROLINA — SHEET NUMBER 101

WAKE COUNTY, NORTH CAROLINA — SHEET NUMBER 102

102

N

(Joins sheet 98)

(Joins sheet 101)

(Joins sheet 103)

(Joins inset, sheet 104)

(Joins sheet 104)

Scale 1:15840

1 Mile 5000 Feet

0 ¼ ½ ¾ 1

0 1000 2000 3000 4000 5000

HARNETT COUNTY

Kennebec

Partins Pond

Black Creek

Little Black Creek

Kenneth Creek

SOUTHERN

DURHAM

Airstrip

Substation

WAKE COUNTY, NORTH CAROLINA — SHEET NUMBER 103

103

N

(Joins sheet 99)

(Joins sheet 102)

(Joins inset, sheet 100)

(Joins sheet 104)

Black Creek

Panther Lake

Mt Pleasant

Fellowship Church

JOHNSTON COUNTY

1 Mile

5000 Feet

Scale 1:15840

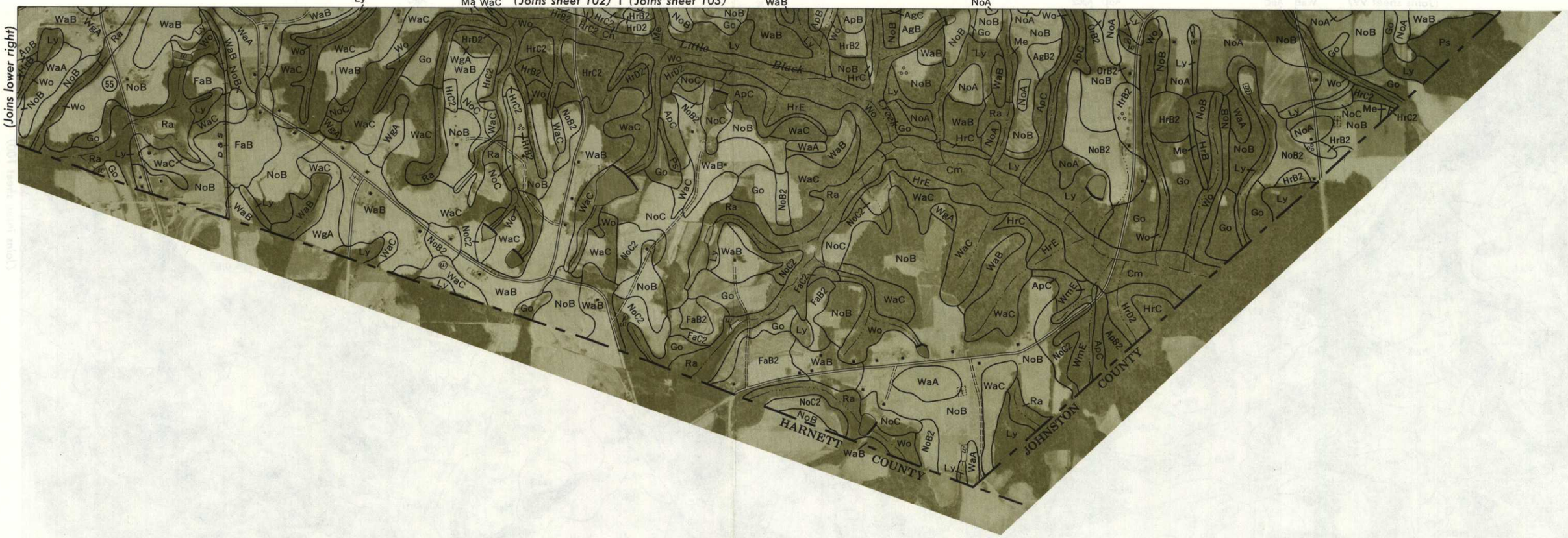
WAKE COUNTY, NORTH CAROLINA — SHEET NUMBER 104

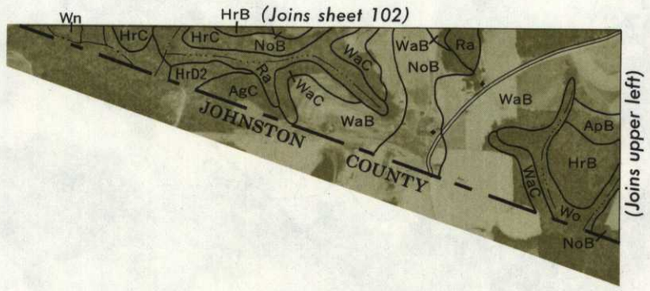
104

N

(Joins sheet 102) | (Joins sheet 103)

(Joins lower right)





1 Mile 5000 Feet

Scale 1:15840